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RESEARCH, DEVELOPMENT AND DEMONSTRATION PROJECTS

Federal Water Quality Administration
Washington, D. C.

July 1970

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PB 230 078

RESEARCH, DEVELOPMENT, AND DEMONSTRATION
PROJECTS

Prepared by

Division of Applied Science and Technology
Office of Research and Development

July 1970

Description of grant and contract projects of the
Division of Applied Science and Technology

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INTRODUCTION

Under the provisions of the Federal Water Pollution Control Act, as amended, the Federal Water Quality Administration is authorized to conduct research, development and demonstration activities in the water pollution control field. These activities may be completed through the in-house effort of Federal laboratories, or they may be carried out through the funding and sponsorship of grant and contract programs.

The purpose of this document is to provide a listing of all grant and contract projects funded by the Division of Applied Science and Technology, Office of Research and Development as of July 1970. This booklet provides the grantee's name, project number and title, the Federal funds committed to the project, and a brief description of the project. Projects are listed by the Planning-Programming-Budgeting-System (PPBS).

For more detailed information on the Federal Water Quality Administration Research, Development and Demonstration Grant and Contract Programs, please contact:

Division of Applied Science and Technology
Federal Water Quality Administration
U. S. Department of the Interior
Washington, D. C. 20242

Allen Cywin, Director
Division of Applied Science and Technology

SECTION 5 PROJECTS

The term "Section 5" refers to a particular section of the Federal Water Pollution Control Act, as amended. This particular section of the Act provides broad authorization to conduct research, investigations, training and information programs. Funds are provided to carry out the provisions of this section, including research by grants and contracts. Projects sponsored under this section of the law may cover a broad range of water pollution control activities. Specific research and development grant and contract types are as defined in the following paragraphs:

Research Grants and Contracts

Awarded to public or private agencies, institutions and individuals to assist in supporting research projects relating to the causes, control and prevention of water pollution. Projects supported are directed toward the discovery and development of new information and technology in the chemical, physical, biological and social sciences, in engineering, and in administrative aspects related to water pollution control.

Grants are awarded for less than 100 percent of the project cost. Contracts may be awarded for up to 100 percent of the project cost.

Demonstration Grants and Contracts

Awarded to public or private agencies, institutions and individuals to assist in investigations and studies of an applied nature, and to develop and demonstrate the feasibility of new methods related to the causes, control and prevention of water pollution. Also supported are projects which evaluate and apply new information and technology.

Grants are awarded at less than 100 percent of the project cost. Contracts may be awarded for up to 100 percent of the project cost.

SECTION 6 PROJECTS

Section 6 of the Federal Water Pollution Control Act, as amended, provides authorization for research and development grant and contract programs for specific pollution problems, namely, storm and combined sewer overflows, advanced waste treatment, and industrial waste pollution control. Grant projects sponsored under this section require matching funds, the amount varying slightly depending on the specific problem. A brief description of each grant program follows:

Storm and Combined Sewer Projects

Grants and contracts are awarded to assist projects which will develop and/or demonstrate new or improved methods of controlling the discharge into any waters of untreated or inadequately treated sewage or other wastes from sewers which carry storm water and sewage or other wastes.

Grants are awarded to states and interstate agencies, municipalities, and intermunicipal agencies for up to 75 percent of the estimated reasonable project cost. Project approval by the appropriate state water pollution control agency or agencies is required.

Contracts are awarded to public and private agencies, institutions and individuals for up to 100 percent of the project cost.

Advanced Waste Treatment Projects

Grants and contracts are awarded to assist projects which will develop and/or demonstrate advanced waste treatment or water purification methods (including the temporary use of new or improved chemical additives which provide substantial immediate improvement in existing treatment processes). Grants and contracts are also awarded for new or improved methods of joint treatment systems for municipal and industrial wastes.

Grants are awarded to states and interstate agencies, municipalities and intermunicipal agencies for as much as 75 percent of the estimated reasonable cost of the project.

Contracts are awarded to public and private agencies, institutions and individuals for up to 100 percent of the project cost.

Industrial Waste Treatment Projects

Grants and contracts are awarded to public and private agencies, institutions, and individuals to support research and demonstration projects for the prevention of pollution of waters by industry, including, but not limited to, treatment of industrial waste. To be supported, projects must develop or demonstrate methods having industry-wide application.

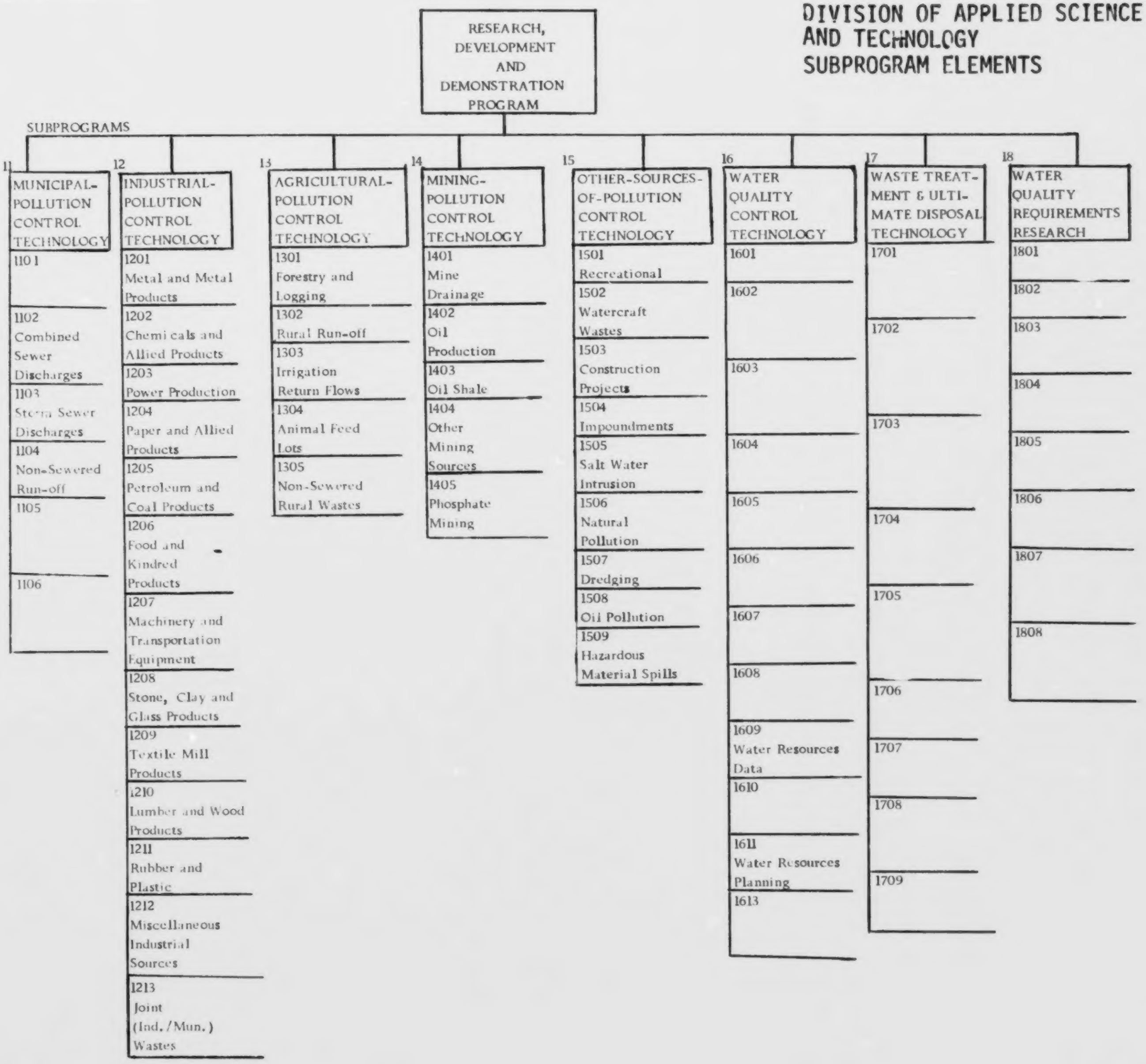
Grants may be awarded for as much as 70 percent of the estimated reasonable cost of the project; the maximum award for any one project is $1 million.

Contracts may be awarded for up to 100 percent of the project cost.

SECTION 14 PROJECTS

The Water Quality Improvement Act of 1970, included a sub-section titled "Area Acid and Other Mine Water Pollution Control Demonstrations," which became Section 14 of the Federal Water Pollution Control Act, as amended. This section provides for grants to State or interstate agencies for up to 75 percent of total project costs. No projects have as yet been funded under this Section.

DIVISION OF APPLIED SCIENCE AND TECHNOLOGY SUBPROGRAM ELEMENTS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INFORMATION SHEET

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 11020 DGZ (Contract 14-12-486)

TITLE OF PROJECT: Fluidic Interceptor Study

GRANTEE OR CONTRACTOR:	**PROJECT DIRECTOR:**
Bowles Engineering Corporation Silver Spring, Maryland	Pete Freeman

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost:	$58,891	**Obligation Date:**	February 4, 1969
Total Federal Cost:	$58,891	**Completion Date:**	October 1969

FINAL REPORT:

TITLE: Design of a Combined Sewer Fluidic Regulator

Abstract: The objective of this program was to demonstrate feasibility, and to develop a workable configuration for a combined sewer Fluidic regulator, whose purpose is to minimize combined sewer discharge while protecting interceptor sewers from overloading during storm flows. A second objective was to develop design procedures and criteria for the general application of this concept to municipal sewer diversion requirements, including preliminary investigations of construction methods, costs, and maintenance requirements. A third objective was to establish a plan and location for an operational demonstration of the concept with a cooperating municipality.

All objectives were successfully met. A generic Fluidic Regulator configuration was evolved which diverts 0 to 75% of the combined sewer flow away from the interceptor as a function of water level sensed in the interceptor sewer, or combined sewer, in either an analog or digital operational mode. Application design criteria were evolved for a range of small to medium sized municipal sewers, in terms of a few basic parameters. Projected installation costs are only slightly more than for conventional diversion structures; while the anticipated construction and maintenance requirements are simple and minimal.

The City of Philadelphia was established as the demonstration site, and a demonstration unit should become operational in late 1970. Recommendations were made for experimental activity to improve regulation linearity; expand application size limit, and to better definitize construction methods and costs.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6(b)
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 11020 DJG

TITLE OF PROJECT: "Proposed Program for Preventing and Eliminating Oil Pollution from the Buffalo River"

GRANTEE:	**PROJECT DIRECTOR:**
City of Buffalo 65 North Vagara Street Buffalo, New York 14202	John Dowing Commissioner of Public Works City of Buffalo

Project Site: Buffalo, New York

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	July 28, 1968	**Project Cost:**	$737,194
Completion Date:	October 1, 1970	**Federal Cost:**	$552,895

DESCRIPTION OF PROJECT

Develop, utilize, and evaluate equipment and techniques for containing and removing oil in the Buffalo River, which is heavily polluted with oil due to the large number of industries located on it and to the sanitary/storm sewers which discharge into it. These methods will not interfere with the navigation of large ships in the river. This work will include utilization of pneumatic barriers for the containment of oil, as well as utilization of mechanical surface oil-boom systems, including the associated recovery equipment (skimmers).
Project Officer: Richard Keppler, FWQA, Boston, Mass. Phone (617) 223-3477.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.
WASHINGTON D. C. 20242

INFORMATION SHEET

Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Grant, under Section 6a1 Demonstration, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
City of Akron
166 South High Street
Akron, Ohio 44308

PROJECT DIRECTOR: (Name and Address)
C. E. Susong
City Engineer
166 South High Street
Akron, Ohio 44308

TITLE OF PROJECT: "Demonstration of Void Space Storage with Treatment and Flow Regulation"

PROJECT SITE: Akron, Ohio

PROGRAM (PROJECT) NUMBER:
11020DXH

DATE OFFERED:
April 24, 1969

DATE ACCEPTED (AWARDED):
May 23, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 5/23/69 Thru: 5/23/72	$ 750,000	$ 562,500

DESCRIPTION OF PROJECT:

The project is to construct, operate and evaluate an underground storage/treatment facility for excess combined sewage. The facility will include novel concepts in construction and operation. It will be an excavated hopper shaped cavity, lined with an impermeable membrane, filled with an inert material covered with soil and the surface made useable. Storage will be in the void space of the fill. The flow regulation of influent will be a new and improved device, probably a fluidic regulator. The sewage will be pre-treated prior to entry to the storage facility. Tube clarifiers will be utilized to compare results with an on-going project where these units are being used for the first time at an operational level on combined sewage.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 29-IDA-2 (11022)

TITLE OF PROJECT: Reduction of Ground Water Infiltration into Sewers by Zone Pumping

GRANTEE OR CONTRACTOR:
Meridian, Idaho

PROJECT DIRECTOR:
John L. Hoffmann

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $25,000

Obligation Date: April 21, 1967

Total Federal Cost: $25,000

Completion Date: June 1969

FINAL REPORT:

TITLE: Sewer Infiltration Reduction by Zone Pumping

Abstract: The intent of this project was to field demonstrate the reduction of ground water infiltration into sanitary sewers by pumped draw down of the water table in the sewer area assuming the geology precipitation and local irrigation practices were amenable to rapid and wide enough zones of influence. It was demonstrated that the water table was lowered and the volume of flow to the treatment plant was reduced. Previously, wet basements were dried. The water table was not lowered uniformly, nor were the characteristics of the relevant geology as uniform as expected. For 140 square blocks, 70 pump units would be required at an average cost of $40,000per unit and a total power bill of $122.50 per day. This is not economically favorable when compared with other corrective measures available at this location.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-29 (11022)

TITLE OF PROJECT: Feasibility and Development of New Methods of Separating Sanitary Sewage from Combined Sewerage Systems

GRANTEE OR CONTRACTOR:
American Society of Civil Engineers
New York, New York

PROJECT DIRECTOR:
M. B. McPherson

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $347,710 **Obligation Date:** November 3, 1966

Total Federal Cost: $347,710 **Completion Date:** October 1969

FINAL REPORT:

TITLE: Combined Sewer Separation Using Pressure Sewers

Abstract: This report is concerned with the separation of community wastewaters and runoff from rainfall and snowmelt in areas presently served by combined and intercepting sewers. Separation is accomplished by withdrawing the wastewater fraction of flows from existing plumbing systems and passing it through a sequence of added systems components as follows: (1) a storage, grinding and pumping building; (2) pressure tubing fished from the unit through each existing building sewer into the existing combined sewer; and (3) pressure piping inserted in that sewer and extending to the existing intercepting sewers that carry the wastewaters to treatment and disposal works.

The feasibility of storing, grinding and pumping sewage from individual residences has been established; and standard comminuting and pumping equipment will be satisfactory for serving larger buildings. Acceptable types of pressure tubing are available that can be entered by workmen. There are combined sewer areas that can be separated most effectively by a version of the method investigated, but generally pressure systems will cost more than new gravity systems. New capabilities developed appear to be of potentially greater use for applications other than separation, such as new construction including utility corridors, and introduce viable alternatives for design of wastewater sewerage.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-34 (11022)

TITLE OF PROJECT: Method to Reduce Water Pollution Caused by Storm Water Sewer Loading by Using Fluid Flow Friction Reducers

GRANTEE OR CONTRACTOR:
The Western Company
Richardson, Texas

PROJECT DIRECTOR:
Jerry Overfield

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $416,463

Obligation Date: December 7, 1966

Total Federal Cost: $416,463

Completion Date: August 1969

FINAL REPORT:

TITLE: Polymers for Sewer Flow Control

Abstract: Six water-soluble polymers were investigated to determine their effects upon aquatic flora and fauna, flow characteristics of wastewater, and the operation of a wastewater treatment plant.

Based upon calculations obtained from flow test data, a maximum flow increase of 2.4 times the flow prior to injection could be obtained if a constant head was maintained. Laboratory flow test data indicated that if flow rates were held almost constant prior to and during polymer injection, a reduction in the static head occurred as a result of friction reduction within the fluid.

The most effective polymers in providing energy reduction were Polyox Coagulant-701, WSR-301, and AP-30; however, AP-30 required higher polymer concentrations to obtain equivalent flow characteristics.

In field tests on a 24-inch diameter line, it was found that polymer concentrations of between 35 and 100 mg/1, decreased frictional flow resistance sufficiently to eliminate surcharges of more than six feet.

Based upon an economic analysis, the average annual cost of new construction was approximately five times the cost of using polymers during peak storm-flow periods.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-19 (11022)

TITLE OF PROJECT: Demonstrate the Feasibility of Reducing Pollution from Combined Sewer Storm Overflows by Means of Periodic Flushing During Dry Weather

GRANTEE OR CONTRACTOR:	**PROJECT DIRECTOR:**
FMC Corporation	John Pelmulder

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost:	$31,093	**Obligation Date:**	December 28, 1966
Total Federal Cost:	$31,093	**Completion Date:**	August 1967

FINAL REPORT:

TITLE: Phase I--Feasibility of a Periodic Flushing System for Combined Sewer Cleaning

Abstract: Under this Phase 1 contract a study was made of sewer flushing practices, application requirements and hydraulic theory, an investigation was made of sampling methods and equipment, and flushing test equipment was designed for use in Phase II and the cost of Phase II was estimated.

In the course of the various background studies it was confirmed that additional detailed information is needed in order to apply a periodic flushing system to actual combined sewers. It was also concluded that the existing information on sewer flushing indicated a good possibility that a periodic flushing system would be feasible for reducing pollution from combined sewer storm water overflow.

The design of flushing evaluation equipment for use in Phase II has been carried to the point that cost estimates can be made for construction of the equipment. A description of the design and the cost estimates are included in this report.

It is recommended that this program be continued into Phase II in order to determine the effectiveness of flushing under various conditions. The work in Phase II should also include the integration of the test results into a design procedure, the design and development of flush station equipment and control systems, the selection and approval of a demonstration location for Phase II, and the preliminary design and cost estimation for the Phase III demonstration.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Demonstration Grant under Section 5, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Tulane University
New Orleans, Louisiana 70118

PROJECT DIRECTOR: (Name and Address)
Dr. Frank W. Macdonald
Professor of Civil Engineering & Public Health
Tulane University

TITLE OF PROJECT: "Bedding and Infiltration Studies of Sanitary Sewers in the Gulf Cost Area"

PROJECT SITE: New Orleans, Louisiana

PROGRAM (PROJECT) NUMBER:
11022 DEI

DATE OFFERED:
August 25, 1969

DATE ACCEPTED (AWARDED):
September 18, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 9/18/69 Thru: 2/14/71	$ 31,385	$ 23,538

DESCRIPTION OF PROJECT:

This is a continuation grant for the fifth and final year of a Demonstration grant. The objectives are to determine the best type of bedding arrangements and the most suitable materials to be used in laying sewer pipes in the Gulf Coast Area. Investigations will also be conducted on the performance of manholes, tees and other appurtenances. Infiltration studies will continue of three in-use sections of sewer lines. This final year will be used in filling voids in the needed data, and the preparation of the final report which will contain a "Manual" section of recommended materials and practices.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Board of County Commissioners
Montgomery County, Ohio

TITLE OF PROJECT: "The Determination of Ground Water Infiltration and the Effects of Internal Chemical Sealing of Sanitary Sewers"

PROJECT SITE: Kettering, Ohio

DATE AWARDED: August 8, 1968

FEDERAL GRANT: $96,570

TOTAL EST. PROJ. COST: $137,000

PROJECT NUMBER: 11022 DHQ

PPBS NO. 1102

DESCRIPTION OF PROJECT:

A demonstration program is to be carried out which will precisely identify the cause and degree of infiltration of surface and ground water into selected sewer sections. After establishing the cause and affects of this surcharging remedial action will be taken utilizing internal sewer sealing with chemicals and pressure grouting. New techniques for ehcmical application will be developed as the work progresses. After and during the sealing program effectiveness and cost data will be analyzed to establish the most effective technique and material with respect to solution of the problem and cost.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

INFORMATION SHEET

CLEAN
WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 11022 DMU (Contract 14-12-456)

TITLE OF PROJECT: Analysis of Regulator Facilities, Their Application and Maintenance Practices

GRANTEE OR CONTRACTOR:
American Public Works Association
1313 East 60th Street
Chicago, Illinois

PROJECT DIRECTOR:
Richard Sullivan

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $132,500

Obligation Date: 8/30/68

Total Federal Cost: $97,800

Completion Date: 5/20/70

FINAL REPORT:

TITLE: Combined Sewer Regulator Overflow Facilities
11022DMU 07/70

Abstract: Current design, operation and maintenance practices used by local jurisdictions in the United States and Canada were determined by personal interviews and compiled in this report. Particular attention was given to the performance of various types of regulators, the use of tide gates, new designs, European practices and the systems concept of combined sewer regulation. Thirty-seven drawings and photographs of regulators are included. Seventeen upgrade regulator facilities and tend to reduce receiving water pollution from combined sewer overflows.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Contract awarded under Sec. 6, Federal Water Pollution Control Act [Clean Water Restoration Act].

CONTRACTOR: FMC Corporation
Central Engineering Laboratories
1185 Coleman Avenue
Santa Clara, California 95052

TITLE OF PROJECT: "Evaluation of a Periodic Flushing System for Combined Sewer Cleaning"

PROJECT SITE: Santa Clara, California

FEDERAL CONTRACT: $323,600 DATE AWARDED: October 9, 1968

PROJECT NUMBER: 14-12-466 PPBS NO: 1102
11022 DNO

DESCRIPTION OF PROJECT:

The objective of this 13-month project is to perform Phase II of a three-phase program to demonstrate the feasibility of reducing pollution from combined sewer storm overflows by means of periodic flushing during dry weather. Included in the total program are study of the theoretical basis for correlating flushing requirements for various sewer conditions, verification of the hydraulic requirements for flushing by test, and installation and systematic operation of flushing equipment in a significant area of an actual combined sewer system.

The test equipment to be built in Phase II consists of 12" and 18" diameter test sewers about 800 feet long, supported above ground so the slope can be adjusted. Flush tanks will be provided at three points along the test sewers.

Based on extensive tests with this facility, system design procedures and criteria for application of sewer flushing systems will be determined. Flushing equipment for use in an actual field environment will be designed and built.

INQUIRIES: Contact the Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[illegible].
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Contract awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR: Melpar, Inc.
7700 Arlington Boulevard
Falls Church, Virginia

TITLE OF PROJECT: "Pilot Plant for Underwater Storage of Combined Sewer Overflow"

PROJECT SITE: Cambridge, Maryland

FEDERAL CONTRACT: $410,386 **DATE AWARDED:** December 14, 1968

PROJECT NUMBER: 14-12-133
11022 DPP **PPBS NO:** 1102

DESCRIPTION OF PROJECT:

Based on preliminary plans and specifications, the contractor will design, construct, operate and evaluate, and be prepared to remove, a pilot plant underwater facility to provide temporary storage of storm overflows from a combined sewer. Pollution of the Anacostia River due to such discharges will be controlled by capturing and temporarily storing the combined sewage in flexible underwater containers until the storm causing overflow has ended.

Storage will be completely under water in a single container having a maximum capacity of 200,000 gallons. The bottom of the tank will be of vinyl coated steel, placed in a depression excavated in Choptank River. The upper half of the storage container will be of flexible neoprene coated nylon material. Two, two speed (600 - 1,000 gpm) pumps will be used to pump the combined sewage to storage, and to remove the untreated sewage from the storage container and return it to the sewerage system for subsequent treatment.

The system will be tested with fresh water during periods when there is no natural storm water overflow.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Avenue, N.W.
Washington, D. C. 20242

INFORMATION SHEET

____
Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Demonstration Grant, under Section 6a1 Federal Water Pollution Control Act (Clean Water Restoration Act),

GRANTEE OR CONTRACTOR: (Name and Address)
New York State Department of Health
84 Holland Avenue
Albany, New York 12208

PROJECT DIRECTOR: (Name and Address)
Leo J. Hetling
(Address same as above)

TITLE OF PROJECT: "A Pressure Sewer System Demonstration"

PROJECT SITE: Albany, New York

PROGRAM (PROJECT) NUMBER:
11022DQI

DATE OFFERED:
March 24, 1969

DATE ACCEPTED (AWARDED):
April 16, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 4/16/69 Thru: 12/70	$ 311,800	$ 200,800

DESCRIPTION OF PROJECT:

The New York State Department of Health proposes a 21 month investigation to install, demonstrate and evaluate a pressure sewer system which could be utilized to separate sanitary sewage from combined sanitary sewage and storm water. A pilot-scale system will be designed to serve 11-12 houses in a redevelopment area in Albany, New York, presently served by combined sewers. Prototype pump-grinder units developed by the General Electric Company as a part of the ASCE Contract (14-12-29) would be utilized to convey sewage from the home to the pressure sewer in the street.

Four principal objectives are incorporated in the project: (1) monitoring, evaluation of the prototype pump-grinder units to determine reliability and need for modification or redesign. (2) test durability of the units operating singly and in concern (manifolded to common pressure sewer). (3) provide proof of the field suitability of the assemblage, which should be considered a module of a larger pressure system. (4) provide new data which would be invaluable in subsequent pressure system applications.

Four principal investigating entities would be involved in conducting the project, each with assigned responsibilities: New York State Department of Health, New York State Pure Waters Authority, American Society of Civil Engineers and the Environmental Technology, Inc.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-139 (11022 DWF)

TITLE OF PROJECT: Pilot Demonstration Underwater Storage Facility for Storm Water Overflow

GRANTEE OR CONTRACTOR:	**PROJECT DIRECTOR**:
Underwater Storage, Inc.- Silver, Schwartz, Ltd. Joint Venture Washington, D.C.	John Russell

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost:	$658,763	**Obligation Date**:	December 14, 1967
Total Federal Cost:	$658,763	**Completion Date**:	December 1969

FINAL REPORT:

TITLE: Control of Pollution by Underwater Storage

Abstract: A pilot plant was designed, constructed and operated to assess the feasibility of providing a facility for the collection, treatment, storage and final disposition of a portion of the storm overflow from a combined sewer system serving a thirty-acre drainage area in Washington, D.C. A Parshall flume was installed in the overflow line for measurement of flow rates and determination of total overflow volume. A portion of the overflow was diverted to the pilot plant through grit chambers and a comminutor. Flow as stored in two 100,000-gallon underwater bags fabricated of nylon reinforced synthetic rubber and fastened to the river bed by a system of patented anchors. During the period of storage, compressed air was delivered to the tanks for agitation of the solids. Following cessation of the storm, contents of the bags were pumped to the interceptor sewer for delivery to the District of Columbia Sewage Treatment Plant at Blue Plains. Flow into and out of each underwater storage tank was metered and recorded. Samples of the combined sewage overflow discharged to the bags and pumped discharge from the bags were collected and subjected to laboratory analyses. During the operation period from January through September 1969, a total of 1,600,000-gallons of diverted overflow from 38-storms was stored in the tanks. In addition, 600,000-gallons of river water was pumped into the underwater storage tanks for testing during dry weather periods. The total amount stored was $341,480 or $1.70 per gallon of storage. The project demonstrated that temporary storage of overflow from combined sewers in underwater rubber storage tanks is feasible and may, under suitable conditions, be effective in eliminating direct, untreated discharge of combined sewage into surface waters during storm periods.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

April 30, 1969
Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Demonstration Grant under Section 6a1, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
City of Dallas
500 South Ervay Street
Dallas, Texas 75201

PROJECT DIRECTOR: (Name and Address) A. E. Holcomb

TITLE OF PROJECT: "Use of Polymers to Reduce or Eliminate Sewer Overflow in the Bachman Creek Sewer"

PROJECT SITE: Dallas, Texas

PROGRAM (PROJECT) NUMBER:
11022DZU

DATE OFFERED:
April 23, 1969

DATE ACCEPTED (AWARDED):
May 23, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 5/23/69 Thru: 6/23/71	$ 441,647	$ 331,233

DESCRIPTION OF PROJECT:

The project consists of the design, construction and evaluation of a permanent polymer injection station on the Bachman Creek Sewer in Dallas, Texas. The project will further demonstrate and evaluate a technique developed earlier for FWPCA by contract which utilizes injection of polymers into a sewer for the purpose of increasing the carrying capacity of the pipe.

During periods of wet weather the Bachman Creek sewer receives excess quantities of ground or storm water due to infiltration. The flow then exceeds its carrying capacity and untreated wastes overflow in at least 10 locations, causing pollution of Bachman Creek. The project will seek to eliminate or greatly reduce the number and volume of untreated overflows by increasing the flow capacity of the Bachman Creek Sewer through the addition of polymers. Design criteria, operating techniques, optimum polymer concentration and other pertinent data critical to the intended use will be evaluated.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Contract awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR: Karl R. Rohrer Associates
529 Grant Street
Akron, Ohio 44311

TITLE OF PROJECT: "Construction of a Facility to Demonstrate Offshore Underwater Temporary Storage of Storm Overflow from a Combined Sewer"

PROJECT SITE: Sandusky, Ohio

FEDERAL CONTRACT: $559,895

DATE AWARDED: December 14, 1967

PROJECT NUMBER: 14-12-143
11022 ECV

PPBS NO: 1102

DESCRIPTION OF PROJECT: A pilot plant underwater facility will be designed, constructed, operated and evaluated as a method of temporarily storing storm overflows from a combined sewer.

Storage will be completely under water in two 100,000-gallon containers of flexible rubber nylon material. These will be attached to a nearly square 24" pipe frame and anchored to the bed of Sandusky Bay of Lake Erie. After passing through a bar screen, the combined sewage will flow by gravity to the storage containers. An 1,800 GPM pump of a non-clogging type will be used to remove the untreated sewage from the storage containers and return it to the sewerage system for subsequent treatment.

Provision will be made for testing the system with fresh water during periods when there is no natural storm water overflow.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Avenue, N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Contract awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR: American Public Works Association-Research Foundation
1313 East 60th Street
Chicago, Illinois 60637

TITLE OF PROJECT: "Causes, Extent and Control of Infiltration"

PROJECT SITE: Chicago, Illinois

FEDERAL CONTRACT: $89,780

DATE AWARDED: May 23, 1969

PROJECT NUMBER: 14-12-550
11022 EFF

PPBS NO: 1102

DESCRIPTION OF PROJECT:

A 15 month study of the causes and control of storm and ground water infiltration into sanitary and combined sewers -- including investigation of sewer design, construction, testing and inspection, and grouting practices. Specific objectives include: (1) catalog the extent and causes, (2) delineate the relative importance of various sources, (3) investigate present design criteria and practices, (4) review present construction, testing and inspection practices and techniques, (5) investigate present infiltration detection, leak location and grouting techniques and practices, (6) identify future research, development and demonstration needs and (7) prepare a "Manual of Recommended Practice"

INQUIRIES: Contact the Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Avenue, N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Municipality of Metropolitan Seattle
400 West Harrison Street
Seattle, Washington 98119

TITLE OF PROJECT: "Duwamish River--Elliott Bay Storm Water Control System"

PROJECT SITE: Seattle, Washington **DATE AWARDED:** December 29, 1966

FEDERAL GRANT: $1,400,000 **TOTAL EST. PROJ. COST:** $3,891,900

PROJECT NUMBER: 11022 ELK **PPBS NO.** 1102

DESCRIPTION OF PROJECT:

A sewerage System Control Scheme designed to regulate and program system flows thru the use of overflow regulators operation-programmed by use of computers. Flows to the waste treatment facilities will be controlled to improve efficiency of plant operation during rainfall periods and to provide selective controlled discharging of storm-water overflow at different points in a manner which will minimize the effect of waste discharges in the receiving waters. Automatic water quality monitors will be utilized as control devices in tirggering discharges to surface water from the regulator stations. Functions of the system for controlling pollution caused by storm water overloading of treatment facilities and sewerage system overflows will be evaluated.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: City of Chicago, Department of Public Works, Chicago, Illinois

TITLE OF PROJECT: "The Lawrence Avenue Underflow Sewer System"

PROJECT SITE:	Chicago, Illinois	**DATE AWARDED:**	March 30, 1967
FEDERAL GRANT:	$1,500,000	**TOTAL EST. PROJ. COST:**	$20,021,067
PROJECT NUMBER:	11022 EMD	**PPBS NO.**	1102

DESCRIPTION OF PROJECT: This project will evaluate the effectiveness of employing a deep tunnel system within a highly developed urban area to temporarily store excess combined sewer flows for return to the sewage treatment plant during off-peak hours. This demonstration will reduce the discharge of untreated combined sewage to the receiving stream and minimize overloading the waste treatment plant. Should this method of control prove to be economically feasible through the use of advanced tunneling equipment, present plans in the Chicago Metropolitan Area envisions a vast network of deep tunnels for ultimate control of all waters in excess of that which can be conducted by the existing drainage systems.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Minneapolis-St. Paul Sanitary District, St. Paul, Minnesota

TITLE OF PROJECT: "Dispatching System for Control of Combined Sewer Losses"

PROJECT SITE:	Minneapolis-St. Paul, Minnesota	**DATE AWARDED:**	May 25, 1966
FEDERAL GRANT:	$870,750	**TOTAL EST. PROJ. COST:**	$1,741,500
PROJECT NUMBER:	11022 FAQ	**PPBS NO.**	1102

DESCRIPTION OF PROJECT: Dispatching system for control of combined sewer losses. The project includes preliminary studies to update historic data, a four phase construction project consisting of installation of a gauging system, a data logger, five river monitors, telemetering rain gages, regulator modifications, and a post-construction program evaluation to include special studies by the University of Minnesota. Existing regulators will be replaced with modern power operated gates at 18 key diversion locations. A supervisory system will be provided to telemeter gate positions, flows and levels in sewers to be controlled by the new regulators. This information will be transmitted to a central point where a dispatching operator can observe conditions and regulate flow accordingly. Maximum utilization of interceptor sewer capacity would be assured and overflow to the river will be minimized.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: City of Detroit, Board of Water Commissioners
735 Randolph Street, Detroit, Michigan

TITLE OF PROJECT: "System Monitoring and Remote Control"

PROJECT SITE: Detroit, Michigan **DATE AWARDED:** September 14, 1966

FEDERAL GRANT: $1,000,000 **TOTAL EST. PROJ. COST:** $2,113,000

PROJECT NUMBER: 11022 FAX **PPBS NO.** 1102

DESCRIPTION OF PROJECT: Reduction in stream pollution caused by combined sewer overflows by installation of modern control equipment for sewage flows thereby maximizing the use of storage within the existing sewer system. The project consists of installation of new power operated diversionary overflow structures and automatic control instrumentation. The instrumentation includes devices for determination of waste water quality, flow measurement, rainfall data, conduit liquid level sensing, and remote operation of diversion gates. Telemetering will be provided to transmit and record data collected by the instruments and to provide feed back data relative to status of the remote controlled units. Investigations will be made to observe the modifications and additions to the system, to analyze and evaluate the data collected, and to determine the overall effectiveness of the demonstration.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET

Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Demonstration Grant under Section 6(a)(1), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
City of Richmond
City Hall
Richmond, Virginia 23219

PROJECT DIRECTOR: (Name and Address)
L. H. Roden, Jr.
Department of Public Utilities
1014 E. Broad Street
Richmond, Virginia 23219

TITLE OF PROJECT: "Stream Pollution Abatement by Supplemental Pumping"

PROJECT SITE: Richmond, Virginia

PROGRAM (PROJECT) NUMBER: 11022 FLV

DATE OFFERED: January 9, 1970

DATE ACCEPTED (AWARDED): January 26, 1970

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 12 mos. Thru:	$ 376,030	$ 282,022

DESCRIPTION OF PROJECT:

The City of Richmond will demonstrate that by-passing of sewage during construction of sewage treatment works can be avoided by applying ingenuity in the areas of engineering design and construction. The project will demonstrate the application of a flexible alternative to the common practice of by-passing raw sewage during construction. The demonstration project includes the construction of a supplemental pumping system incorporating a special diversion device which will permit the wastewater treatment plant to remain on-stream during the tie-in of critical elements of the treatment works. The system will be designed so that it will not only achieve by-pass prevention, but will also demonstrate the use of expeditious, low-cost techniuqes that may include removable dredge or other pumps which can be utilized in other portions of the sewerage system or loaned to other communities with by-pass problems.

The City will maintain detailed records, including pictorial information, relating to the design, construction, operation and maintenance during the entire project period and will evaluate the data to assess the value of the techniques employed for potential nationwide application.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Grant, under Section 6(a)(1), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Philadelphia Water Department
1160 Municipal Services Building
Philadelphia, Pennsylvania 19107

PROJECT DIRECTOR: (Name and Address)
Carmen F. Guarino
(Same as above)

TITLE OF PROJECT: "Combined Sewer Fluidic Regulator Demonstration"

PROJECT SITE: Philadelphia, Pennsylvania

PROGRAM (PROJECT) NUMBER: 11022 FWR

DATE OFFERED:

DATE ACCEPTED (AWARDED):

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 24 months Thru:	$111,445	$74,410

DESCRIPTION OF PROJECT: This project would utilize the design rationale developed under FWQA Program No. 11024 DGZ, (Contract 14-12-486) in the design, construction and operation of a full-size combined sewer fluidic regulator installed in two typical locations in the Philadelphia sewer system.

The specific objectives of the project are the following:

1. Design, construction and operation of a fluidic regulator for a flow range below 2 CFS with a minimum of reconstruction. The unit will be capable of demonstrating fluidic action on demand by use of city water to simulate storm flow and a transparent top for observation.

2. Design, construction and operation of a fluidic regulator for a 4 CFS peak dry weather flow. This will demonstrate the use of a fluidic device at higher flows on combined sewerage. The automatic control of the overflow will be done by sensing the interceptor level. No overflow will occur until the interceptor reaches a pre-determined limit.

3. Evaluate the operation of above fluidic devices over a years period, and relate their performance, both advantages and disadvantages to conventional regulators throughout the Philadelphia sewer system.

4. Assembly of all data from the evaluation & testing program including rainfall data, overflow vs. sensor height so that the application of fluidics to sewer regulator design can be demonstrated on a full-scale basis.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-23 (11023)

TITLE OF PROJECT: The Feasibility of the Use of Ultrasonic Filtration in Treating the Overflows from Combined and/or Storm Sewers

GRANTEE OR CONTRACTOR:	**PROJECT DIRECTOR:**
Acoustica Associates Los Angeles, California	Robert Rod

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost:	$75,693	**Obligation Date:**	June 8, 1967
Total Federal Cost:	$75,693	**Completion Date:**	September 8, 1967

FINAL REPORT:

TITLE: Demonstrate Feasibility of the Use of Ultrasonic Filtration in Treating the Overflows from Combined and/or Storm Sewers

Abstract: The feasibility of employing ultrasonic filtration for treating overflows from combined and/or storm sewers has been demonstrated in a three-month laboratory test program. This new technique involves the use of permanent-type low-head filter elements which are mounted within canisters into which ultrasonic energy is applied on a programmed basis. The beneficial effect of the ultrasonic energy is manifested in three significant ways: (1) the total quantity of influent filtered between backwash cycles increased by factors of from four to 18 times; (2) length of filter runs between required backwashing was extended from four to ten times; and (3) ultrasonic energy used during backwashing can restore the filter elements to "like-new" condition without necessitating frequent filter replacements or maintenance work of any kind.

Reductions in BOD and suspended solids averaging between 40% and 70% were obtained in a selected number of tests with raw sewage diluted in varying degree with water using 20 and 50 micron elements at filtration rates approximating 10 gpm/sq. ft. and at a head loss of from 1 to 4 psi. Based upon the tests conducted with simulated "combined" sewage, it is concluded that the ultrasonic filtration system is technically and economically feasible for full-scale waste water treatment use.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-24 (11023)

TITLE OF PROJECT: Design, Construction, Operation and Evaluation of a Demonstration Waste Treatment Device Termed the 'Rotating Biological Contactor'

GRANTEE OR CONTRACTOR:
Allis Chalmers
Milwaukee, Wisconsin

PROJECT DIRECTOR:
Fred Welch

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $388,526

Obligation Date: September 28, 1967

Total Federal Cost: $388,526

Completion Date: May 1969

FINAL REPORT:

TITLE: Municipal Sewage Treatment with a Rotating Biological Contactor

Abstract: A Rotating Biological Contactor (RBC) was installed at the Milwaukee Metropolitan Sewerage Commission treatment plant at Jones Island to demonstrate the feasibility of treating municipal waste with an RBC system.

The RBC system effectively treated domestic sewage at high loading rates. Ninety percent COD removal was attained at a loading of 350 to 400 pounds of COD per day per thousand cubic feet of disc volume. Pounds of COD removed increased with pounds of COD applied. Efficiency of treatment improved with increased retention time. Percent BOD removal was approximately five percent greater than percent COD removal. Lower disc speed resulted in a slightly lower efficiency. Lower strength wastes are not as efficiently treated as higher strength wastes at the same organic loading. Recovery from high hydraulic loading is rapid.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-17 (11023)

TITLE OF PROJECT: Feasibility Investigation of a Self Cleaning Strainer and a Self Cleaning Filter

GRANTEE OR CONTRACTOR:
Fram Corporation
Research Division
East Providence, Rhode Island

PROJECT DIRECTOR:
Dr. S. S. Blecharczyk

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $32,733

Obligation Date: December 27, 1967

Total Federal Cost: $32,733

Completion Date: July 1969

FINAL REPORT:

TITLE: Strainer/Filter Treatment of Combined Sewer Overflows

Abstract: The primary objective of this feasibility study was to evaluate the principle of a 'self-cleaning strainer, self-cleaning filter' concept for the treatment of combined sewer overflows. The anticipated goal was to design and construct a prototype system capable of handling up to 1000 gallons per minute with a B.O.D. reduction near 60 percent, and with the capability of automatic operation in remote locations.

The strainer and filter systems were evaluated using the synthetic substrate, primary influent to two separate municipal treatment plants, fresh sewage solids and actual combined sewer flow. It was demonstrated that the strainer model produced consistent suspended solids removal rates near 35 percent under highly varying load conditions, at a flux of 25 gallons per minute per square foot.

The diatomite study showed operational success could be achieved at a 50 percent organic reduction rate at 4 gallons per minute per square foot of area, but at a minimum estimated operating cost of $1.50 per 1000 gallons.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-27 (11023)

TITLE OF PROJECT: Feasibility Study of a Stabilization-Retention Basin for the Treatment of Combined Sewer Overflows, Wastewater Treatment Plant Effluents & Surface Runoff Water at Cleveland, Ohio

GRANTEE OR CONTRACTOR:
Havens and Emerson
Cleveland, Ohio

PROJECT DIRECTOR:
Lamont W. Curtis

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $87,766

Obligation Date: November 2, 1966

Total Federal Cost: $87,766

Completion Date: May 1968

FINAL REPORT:

TITLE: Feasibility of a Stabilization-Retention Basin in Lake Erie at Cleveland, Ohio

Abstract: A feasibility study was conducted of a large stabilization-retention basin to be constructed in Lake Erie at Cleveland, Ohio. The stabilization is viewed as a possible alternative to separation of a combined sewer system. The proposed basin would treat flows from a number of large combined sewer overflows, from several polluted streams, and effluent from a large secondary wastewater treatment plant. Treatment would consist of bio-oxidation, sedimentation, stabilization and disinfection. A shoreline collection system is included to convey flows to the basin.

The chemical, biological, physical and structural aspects of the proposed basin were studied, and the probable benefits to water quality and the effectiveness of the basin as a treatment device were evaluated. Estimates of cost of the basin and collection system were prepared, and it was concluded that the stabilization basin would provide a higher degree of pollution abatement than would separation of sanitary and storm sewers, at about one-third the cost.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-39 (11023)

TITLE OF PROJECT: Proposal for a Self-Adjusting and Self-Cleaning Filter Feasibility Study

GRANTEE OR CONTRACTOR:
Hercules, Incorporated
Cumberland, Maryland

PROJECT DIRECTOR:
J. R. Cathey

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $108,293

Obligation Date: October 6, 1967

Total Federal Cost: $108,293

Completion Date: October 1968

FINAL REPORT:

TITLE: Crazed Resin Filtration of Combined Sewer Overflows

Abstract: The feasibility of developing a self-cleaning, self-adjusting filtering device constructed of cylindrical structure of fibers laid down in predetermined patterns by a winding process and bonded in place by resins was investigated. The permeability of the structure is imparted by a mechanical cracking or crazing of the resin. The tube would act as a normal pipe under open channel flow. Surcharging or pressurization to 4 psig would cause the walls to become permeable. Filtration runs indicated a 62% reduction of suspended solids in the filtrate. However, sustained runs could not be realized. The self-cleaning aspect was not demonstrated.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-11 (11023)

TITLE OF PROJECT: Use of a New Technique for Waste Treatment

GRANTEE OR CONTRACTOR:	**PROJECT DIRECTOR:**
Rhodes Corporation Ft. Smith, Arkansas	Robert C. Pugh

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost:	$317,733	**Obligation Date:**	December 28, 1966
Total Federal Cost:	$317,733	**Completion Date:**	January, 1970

FINAL REPORT:

TITLE: Dissolved-Air Flotation Treatment of Combined Sewer Overflows

Abstract: A dissolved-air flotation system was evaluated for primary treatment of combined sewer overflows. The major pieces of component equipment were a gyratory screen, hydrocyclones, an air dissolving tank, and a flotation cell.

The principal aspects investigated were: (1) Performance of the system during rain events and dry periods; (2) Evaluation of individual components; (3) Capital costs and operating costs for utilizing a flotation system for various size combined sewage overflows; (4) The adaptability of the system for automation and use in remote location; and (5) The ability of the system to treat intermittent and highly variable flows from combined sewage systems. Some chemical aids to flocculation were also tested.

The system performed comparably to conventional clarifiers. It appears dissolved-air flotation systems would be economical for handling combined sewer overflows up to 8 MGD. Automation of dissolved-air flotation systems appears possible with conventional control equipment. Chemical aids to flocculation appear to have promise that warrants further study.

The system was unique in that all liquid flow passed directly through the air dissolving tank with no recycle. Domestic sewage was studies in lieu of combined sewage during periods of no rain.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Springfield Sanitary District

TITLE OF PROJECT: "Evaluation of a Stabilization Pond for Treatment of Combined Sewer Overflows"

PROJECT SITE: Springfield, Illinois **DATE AWARDED:** June 14, 1966

FEDERAL GRANT: $86,570 **TOTAL EST. PROJ. COST:** $199,140

PROJECT NUMBER: 3-ILL-1 **PPBS NO.** 11023

DESCRIPTION OF PROJECT: The goal of this project is to determine the effectiveness of a stabilization pond as an overflow treatment device for combined sewage. A twelve-acre stabilization pond will receive the flow by-passed at an existing pumping station during periods of precipitation. This pond will intercept short duration, high intensity rainfalls. The system will provide both temporary storage and treatment of the overflow.

Evaluation of the facility will not only include routine sampling of influent and effluent, but will also include biological sampling of the pond and the receiving stream.

INQUIRIES: ***Contact the*** Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET

Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Research Contract, under Section 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Rex Chainbelt, Incorporated
Technical Center
Milwaukee, Wisconsin

PROJECT DIRECTOR: (Name and Address)
Dr. William Katz
Rex Chainbelt, Incorporated Technical Center
Milwaukee, Wisconsin

TITLE OF PROJECT: "Development and Demonstration of Combined Sewage Treatment Utilizing Screening, Chemical Oxidation and Split Flow Air Flotation"

PROJECT SITE: Milwaukee, Wisconsin

PROGRAM (PROJECT) NUMBER:
11023
Contract No. 14-12-40
DATE OFFERED:

DATE ACCEPTED (AWARDED):
October 6, 1967

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 10/6/67 Thru: 6/1/72	$ 355,322	$ 355,322

DESCRIPTION OF PROJECT:

The originally contracted work was to design, fabricate and demonstrate a system for the treatment of combined sewage using new techniques in chemical oxidation and high rate dissolved air flotation. The project will treat 5 MGD of combined sewage. The dissolved air flotation unit will be operated at recycle rates from 5 to 30 percent of the total flow with 40 to 80 psig. This phase is scheduled for completion July 31, 1970. A final report will be published. A contract modification stipulates additional tasks to be accomplished under their contract. An investigative and demonstration phase on the utilization of sequential screening both above and in conjunction with air flotation will be conducted. The screen size will progress from 1,840 microns to 60 microns. This work will be completed and a final report issued by June 1, 1972.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET - - -

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R & D Contract awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR: Ionics Incorporated
65 Grove Street
Watertown, Massachusetts 02172

TITLE OF PROJECT: Feasibility of High Current Density Hypochlorite Generation

PROJECT SITE: Watertown, Mass.

DATE AWARDED: Feb. 19, 1969

FEDERAL CONTRACT: 14-12-490

TOTAL PROJ. COST: $74,646.00

PROJECT NUMBER: 11023 DAA

PPBS NO: 1102

BRANCH CHIEF: William Rosenkranz, Chief
Storm & Combined Sewer Pollution Control Br.

PROJECT OFFICER: Allyn Richardson
Northeast Region

DESCRIPTION OF PROJECT:

Ionics, Inc. will conduct a one year study to determine the feasibility and economics of operation of a high current density (400-500 A/SF) hypochlorite generator for utilization in the treatment of combined sewer overflows and/or storm sewer discharges. If technical and economical feasibility is determined, the contractor will prepare a prototype design in sufficient detail to permit fabrication and field testing of a full-scale device. The prototype design shall be modular in nature and compatible with current hypochlorite feeding devices. Over-all operation and maintenance costs shall be developed. A operation and maintenance manual will be provided.

INQUIRIES: Contact the
Storm & Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
Washington, D.C. 20242

INFORMATION SHEET

Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a R & D Grant, under Section 6 (a) (1), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Metropolitan District Commission
20 Somerset Street
Boston, Massachusetts

PROJECT DIRECTOR: (Name and Address)

TITLE OF PROJECT: "The Somerville Marginal Conduit Including Pretreatment Facilities"

PROJECT SITE: Somerville, Massachusetts

PROGRAM (PROJECT) NUMBER: 11023 DME

DATE OFFERED: **February 16, 1970**

DATE ACCEPTED (AWARDED): March 31, 1970

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From:	Total $ 1,485,000	$ 452,000
Thru:	Eligible $602,667	

DESCRIPTION OF PROJECT: The project will develop, demonstrate and evaluate a treatment method for excess combined sewage. The treatment will consist of screening and chlorination. A suitable screening technique will be developed The chlorination process will involve new and improved utilization of high current density electrolytic process to generate a sodium hypochlorite solution for disinfection of combined sewage. The construction will be coordinated with adjacent highway construction and drainage and recreational water protection.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Contract, under Section 6a1, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Battelle Memorial Institute
Pacific Northwest Laboratory
P.O. Box 999
Richland, Washington 99352

PROJECT DIRECTOR: (Name and Address)
Allen J. Shuckrow
Pacific Northwest Laboratory
Battelle Memorial Institute
Richland, Washington 99352

TITLE OF PROJECT: "Development, Demonstration and Evaluation of Physical-Chemical Treatment of Combined Storm-Sanitary Sewage"

PROJECT SITE: Richland, Washington, and selected field sites

PROGRAM (PROJECT) NUMBER:
14-12-519
11023 DSQ

DATE OFFERED:

DATE ACCEPTED (AWARDED):
June 23, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 6/23/69 Thru:12/23/72	$ 391,310	$391,310

DESCRIPTION OF PROJECT:

The project is a two and one-half year development, demonstration and evaluation of the applicability, effectiveness and economics of a physical-chemical method of treating combined sewage. The basic process to be demonstrated utilizes powdered activated carbon adsorption, inorganic coagulation, polyelectrolyte flocculation, sedimentation and spent carbon regeneration.

Treatment units and process methodology will be specifically designed to meet the constraints of high and widely fluctuating wastewater volumes, widely varying wastewater quality, short detention times, intermittant use, low first cost and economics of operation, and small construction sites. Beginning with bench-scale design experiments the process will be carried thru pilot-scale operations and detailed evaluation of the method.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: City and County of San Francisco
Public Works Department, 260 City Hall
San Francisco, California 94102

TITLE OF PROJECT: "Treatment of Combined Sewer Overflows by the Dissolved Air Flotation Process"

PROJECT SITE: San Francisco, Calif.

DATE AWARDED: July 24, 1968

FEDERAL GRANT: $921,000

TOTAL EST. PROJ. COST: $1,463,000

PROJECT NUMBER: **11023 DXC**

PPBS NO. 1102

DESCRIPTION OF PROJECT:

The project consists of the design, construction and evaluation of a combined sewer overflow treatment facility at the Baker Street Outfall consisting of trash racks, short-term sedimentation for removal of settleable solids, dissolved air flotation for removal of particulate and liquid floatables and disinfection utilizing chlorine.

Conditions of the receiving waters will be thoroughly investigated prior to placing the facility in operation and the cost/effectiveness of the treatment facility evaluated following construction.

The character of combined sewage in the drainage area tributary to the Baker Street Outfall will be defined and the applicability of the treatment process to other outfalls in the San Francisco sewerage system assessed.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[illegible]
Washington, D. C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 11023 DZF (14-12-195)

TITLE OF PROJECT: Fabrication and Evaluation of an Ultrasonic System for Treating Combined Sewer Overflows

GRANTEE OR CONTRACTOR:
American Process Equipment Corp.
3309 W. El Segundo Blvd.
Hawthorne, California 90250

PROJECT DIRECTOR:
Robert Rod

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $248,500

Obligation Date: June 25, 1968

Total Federal Cost: $248,500

Completion Date: June 19, 1970

FINAL REPORT:

TITLE: Ultrasonic Filtration of Combined Sewer Overflows, 11023 DZF 06/70

Abstract: A compact trailer-mounted 250,000 gpd self-cleaning ultrasonic microfiltration system was tested with influents ranging from simulated combined sewer overflows to conventional primary sewage treatment plant effluent. Twenty 35 micron porous polyethylene elements having 0.8 sq. ft. of surface area each comprised the system.

High concentrations of rust in the influent and in the backwash water prevented demonstrating the feasibility of treating combined sewer overflows.

With influent BOD and suspended solids levels of 100 mg/l, or less, ultrasonic filtration though inexpensive 35 micron polyethylene elements can reduce BOD and SS in raw settled sewage or effluents from primary and secondary treatment plants by 50%. Space required for a 25 MGD filtration system is less than 20,000 square feet, and the cost for treating 1,000 gallons is $0.08, excluding pretreatment.

A novel vortex separator incorporating flotation techniques developed by the Contractor and tested in a prototype version with raw sewage reduced BOD by 45% and influent solids by 80%.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Demonstration Grant under Section 6a1, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
City of Kenosha
100-51st Place
Kenosha, Wisconsin
Mr. O. Fred Nelson

PROJECT DIRECTOR: (Name and Address)
Rex-Chainbelt Technical Center
5101 West Beloit Road
West Milwaukee, Wisconsin 53214

TITLE OF PROJECT: "Demonstration Project of Biological Absorption of Pollutants from Combined Storm Water Runoff and Sanitary Sewage"

PROJECT SITE: Kenosha, Wisconsin

PROGRAM (PROJECT) NUMBER: 11023EKC

DATE OFFERED: July 23, 1969

DATE ACCEPTED (AWARDED):
September 5, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 9/10/69 Thru: 6/10/72	$ 730,000	$547500

DESCRIPTION OF PROJECT:

The project objective is to provide a means for high rate biological treatment of combined sewage by the utilization of viable, activated sludge, clarification and disinfection. The method will be to store sludge in a biosolids reservoir and maintain a contact tank and solids stabilization tank in an empty and ready condition at the sewage treatment plant.

When a rain event occurs the excess combined sewage will be directed to the contact tank and the activated sludge proportionally introduced. The tank will be designed to have 15-30 min contact time. From the contact tank the flow will be directed to a clarifier for solids separation. The effluent will be disinfected and discharged to Lake Michigan with solids returned to the solids stabilization tank and reused or wasted to the digesters.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 11023 EVO (Contract 14-12-136)

TITLE OF PROJECT: Microstraining Pilot Tests

GRANTEE OR CONTRACTOR:	**PROJECT DIRECTOR**:
Crane Company Cochrane Division Crane Circle King of Prussia, Pennsylvania 19406	Mr. William A. Keilbaugh

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $180,086	**Obligation Date**: 12/27/67
Total Federal Cost: $180,086	**Completion Date**: 12/27/69

FINAL REPORT:

TITLE: Microstraining and Disinfection of Combined Sewer Overflows
11023EVO 06/70

Abstract: Microstraining, using a microstrainer screen of a nominal aperture of 23 microns, removed up to 98% of the suspended solids from a combined sewer overflow. The sewer, in a residential area of Philadelphia, has an average dwf of 1,000 gph. The maximum combined sewer flow during rainstorms in one year of operation was 304,000 gph (11.3 cfs).

Volatile suspended solids removals with the above screen have averaged 68% and 71% during different test periods.

Results indicated that there was a slightly better kill of coliform group bacteria with chlorine than with ozone in the Microstrainer effluents when both were used at an initial nominal concentration of 5 ppm, with 5 to 12 minutes detention time. However, chlorine was applied at slightly higher levels and with better control than ozone.

Preliminary estimates of the costs of treatment via microstraining, using tentatively-established throughput rates, show that the capital costs per acre of drainage would be approximately $10,200 for microstraining alone, $11,200 for microstraining plus chlorination, and $19,800 for microstraining plus ozonation.

Of eight other currently-proposed schemes, whose costs were estimated, only surface impoundment (where aesthetically acceptable and where low cost land is available) appears competitive.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-855 (11023 EYC)

TITLE OF PROJECT: "Flocculation-Flotation Concept for Sewage Solids Separation"

CONTRACTOR:	**PROJECT DIRECTOR**
Hercules, Incorporated Allegany Ballistics Laboratory Cumberland, Maryland 21502	Mr. Donald H. Graham Allegany Ballistics Laboratory Cumberland, Maryland 21502

Project Site: Cumberland, Maryland and Milwaukee, Wisconsin

SPECIFIC DATA ABOUT THIS AWARD

Award Date: April 22, 1970	**Project Cost:** $117,934
Completion Date: July 1, 1971	**Federal Cost:** $117,934

DESCRIPTION OF PROJECT

The objective is to develop and assess the variables associated with the co-flocculation of sewage particles onto flotation aids. This will include definition of (1) flotation aid buoyance; (2) flotation aid water adsorbance characteristics, (3) flotation aid sewage solids concentration versus buoyant effect, (4) flotation aid concentration - separation time - solids loading parameters, (5) sewage solids shock load effects, (6) solids pre-screening classification, and (7) optimum flocculation scheme and dynamic flow parameters permissible for treatment in continuous in-line (non-mechanical) and tank systems.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

WPCHQ-9200-2
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-858 (11023 EYI)

TITLE OF PROJECT: "Ultra High Rate, Deep Bed, Multi-Media Filtration for Treating Combined Sewage"

CONTRACTOR:

Hydrotechnic Corporation
641 Lexington Avenue
New York, New York 10022

PROJECT DIRECTOR

Dr. Ross Nebosline
Hydrotechnic Corporation
641 Lexington Avenue
New York, New York 10022

Project Site: Cleveland, Ohio

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 4, 1970

Completion Date:

Project Cost: $310,200

Federal Cost: $310,200

DESCRIPTION OF PROJECT

The objective is to develop and evaluate the applicability of ultra high rate, deep bed, multi-media filtration units for treating excess combined sewage. Major emphasis will be placed on: determining the most suitable filter media in terms of sizes, depths, and composition; in determining the most suitable additives for improving filterability properties and shear strength of the organic material; determination of optimum operating modes; and comparative cost analysis.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: City of Cleveland
City Hall, 601 Lakeside Avenue
Cleveland, Ohio 44114

TITLE OF PROJECT: "A Program for Demonstrating Combined Sewer Overflows Control Techniques for Water Quality Improvement and Beach Protection"

PROJECT SITE: Cleveland, Ohio

DATE AWARDED: May 3, 1968

FEDERAL GRANT: $325,162

TOTAL EST. PROJ. COST: $1,030,000

PROJECT NUMBER: 11023 EZW

PPBS NO. 1102

DESCRIPTION OF PROJECT:

The project consists of the immediate application of several control and treatment methods designed to abate pollution from combined sewer overflows and control of water quality at the Edgewater and White City bathing beaches on Lake Erie in the City of Cleveland. Control and treatment measures to be applied include:

(1) Hypochlorination of combined sewer overflows and local streams contributing to pollution of beach areas.
(2) Use of polymers to reduce overflows by increasing interceptor flow capacity.
(3) Initiation of a sewer flushing program to reduce solids discharged from the drainage area tributary to the Edgewater overflow.
(4) Screening of overflows and streams.
(5) Construction of sheet piling and flexible barriers to enclose beach areas.
(6) Control of water quality within enclosed beach areas.
(7) Collection of debris and coarse solids.
(8) Miscellaneous sewerage system improvements.

INQUIRIES: ***Contact the*** Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: City of Columbus, Ohio

TITLE OF PROJECT: "Modification of Whittier Street Storm Standby Tanks"

PROJECT SITE: Columbus, Ohio

DATE AWARDED: March 30, 1967

FEDERAL GRANT: $300,000

TOTAL EST. PROJ. COST: $1,231,519

PROJECT NUMBER: 11023 FAL

PPBS NO. 1102

DESCRIPTION OF PROJECT:

This project consists of an evaluation of the pollution reduction effectiveness of storm overflow tanks modernized by installation of automated sluice gates and other equipment.

Physical features of the project consist of the renovation of three existing combined sewer overflow tanks having a capacity of 1.3 mg each. The renovation includes automatic controls for the tank influent sluice gates, new travelling bridge type sludge collectors and new pumps. One objective of the automation is to keep sludge levels low by continuously removing it from the tanks and thereby preventing anaerobic decomposition and its resultant odors. Another objective is to control flows at the treatment plant by proper use of the automatically operated sluice gates. The improvements in tank efficiencies are expected to reduce bacterial contamination of the receiving stream, the Scioto River.

Evaluation will include studies of the efficiency of the tanks as treatment units as well as studies of the effect of the system on the river.

INQUIRIES: *Contact the*

Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: **City of Shelbyville, Illinois**

TITLE OF PROJECT: **"Systems Approach to Combined Sewer Storm Water Overflow Pollution Abatement"**

PROJECT SITE: **Shelbyville, Illinois** *DATE AWARDED:* March 30, 1967

FEDERAL GRANT: **$440,000** *TOTAL EST. PROJ. COST:* $2,295,077

PROJECT NUMBER: 11023 FAM *PPBS NO.* 1102

DESCRIPTION OF PROJECT:

A demonstration of a systems approach to pollution abatement is the goal of this project. The effectiveness of treating combined sewer overflows from small drainage areas in three types of detention and treatment units will be evaluated. These individual units will be coordinated into a total control system for the community.

Units to be installed and evaluated under the grant include:

(1) **A storm overflow lagoon, designed for 5-day detention of a 10-year storm, followed by primary and secondary stabilization lagoons will receive flow from 95% of the drainage area.**
(2) **A storm overflow lagoon designed for 600% of dry weather flow.**
(3) **A primary storm holding tank for 600% of dry weather flow for 2-hr detention and equipped with a chlorinater, comminutor solids collecting facilities and a lift station to pump sludge to the treatment plant.**

INQUIRIES: Contact the

Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Borough of New Providence, New Jersey

TITLE OF PROJECT: "Utilization of High Rate Trickling Filters for Treatment of Combined Sewer Overflows"

PROJECT SITE: New Providence, N.J. **DATE AWARDED:** June 16, 1967

FEDERAL GRANT: $474,000 **TOTAL EST. PROJ. COST:** $1,187,680

PROJECT NUMBER: 11023 FAN **PPBS NO.** 1102

DESCRIPTION OF PROJECT:

Two high rate trickling filters will be installed to accommodate and treat the extremely wide range in volume of overflows which occur during periods of rainfall. Overflows are presently discharged untreated to the receiving waters, causing organic and bacterial pollution. Adaptation of this conventional treatment method to adverse operating conditions to achieve treatment of combined sewage prior to discharge will be demonstrated. One trickling filter will be constructed with a plastic filter medium; the other, with conventional trap rock or stone filter medium. Following the filters, facilities will be provided to add polyelectrolytes and other chemicals to improve sedimentation efficiency in the final settling tank, also as a part of this project. Chlorination facilities will disinfect the final effluent.

The facilities will be operated so as to maintain biological growth on the filters during dry weather periods, making the filters effective during periods of overflow. A monitoring program will thoroughly evaluate the operation and effectiveness of the separate treatment units as well as the overall effectiveness of the entire installation. The system operation will be varied so as to develop the most effective and economical plant operation to achieve the desired results.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: City of New York

TITLE OF PROJECT: "Evaluation of Spring Creek Auxiliary Pollution Control Project"

PROJECT SITE: New York City, New York **DATE AWARDED:** December 26, 1967

FEDERAL GRANT: $843,750 **TOTAL EST. PROJ. COST:** $1,126,000

PROJECT NUMBER: 11023 FAO **PPBS NO.** 1102

DESCRIPTION OF PROJECT:

Overflows from combined sewers contribute significantly to the pollution of Jamaica Bay, New York City in constructing a major combined sewage treatment facility "Spring Creek Auxiliary Pollution Control Project" specifically designed to provide sedimentation and chlorination treatment to combined sewage. The demonstration project will establish pre-construction water quality conditions in Jamaica Bay, Spring Creek area, and location of all sources contributing to pollution of the Bay. Characterization of parameters that measure the effects of combined sewers will be apart of the investigations. Following construction the effectiveness of the combined sewage treatment facilities will be evaluated. It is anticipated that the Spring Creek facility will serve as a prototype for additional projects leading to an upgrading of the quality of Jamaica Bay waters.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: City of Somersworth, New Hampshire

TITLE OF PROJECT: "Somersworth Combined Sewage Overflow Treatment Project"

PROJECT SITE: Somersworth, N. H.

DATE AWARDED: December 1, 1967

FEDERAL GRANT: $559,080

TOTAL EST. PROJ. COST: $931,800

PROJECT NUMBER: 11023 FAP

PPBS NO. 1102

DESCRIPTION OF PROJECT:

Construction and evaluation of the applicability of two one-million gallon combined sewage treatment and storage tanks. Pollution of receiving waters caused by discharge of untreated combined sewage during wet weather periods will be abated by providing facilities which will accomplish (a) short-term detention chlorination and pump-back to the sewerage system and (b) variable sedimentation times, chlorination, long-term detention and discharge to receiving waters. Effects of treatment on the receiving stream and sewage stabilization pond, technical and economic benefits will be evaluated. Potential benefits of polymers to increase carrying capacity of the interceptor will be explored.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: City of Mt. Clemens, Michigan

TITLE OF PROJECT: "A Combined Sewerage Collection and Treatment Facility"

PROJECT SITE: Mt. Clemens, Michigan **DATE AWARDED:** February 28, 1968

FEDERAL GRANT: $631,989 **TOTAL EST. PROJ. COST:** $918,500

PROJECT NUMBER: 11023 FAR **PPBS NO.** 1102

DESCRIPTION OF PROJECT:

Overflows from combined sewers cause pollution of the Clinton River during wet-weather periods. The project is designed to demonstrate the feasibility of controlling such pollution by constructing three aerated "Lakelets" to serve as treatment units. The "Lakelets" will be equipped with surface aerators and operated in series. Effluent from the first two ponds will be subjected to chemical treatment and microstraining, with the final effluent from the third pond receiving similar treatment and chlorination prior to discharge to the Clinton River. The project will explore the potential of the Lakelets as recreation facilities for boating and fishing as a part of park operation.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Sewerage and Water Board of New Orleans, New Orleans, Louisiana

TITLE OF PROJECT: "Chlorination and Hypochlorination of Polluted Storm Water Pumpage"

PROJECT SITE: New Orleans, La.

DATE AWARDED: December 2, 1966

FEDERAL GRANT: $1,034,250

TOTAL EST. PROJ. COST: $1,429,000

PROJECT NUMBER: 11023 FAS

PPBS NO. 1102

DESCRIPTION OF PROJECT:

To control bacteriological pollution in Lake Pontchartrain the project will demonstrate the effectiveness, efficiency, and economics of using open drainage canals as treatment facilities; the effectiveness of chlorine and hypochlorite disinfection on intermittent high flow discharges; and the optimization of various feeding rates, multiple points of application, and contact time. Facilities for disinfection will be placed and operated in the St. Charles Canal, the London Avenue Canal and the Orleans Avenue Canal. A sodium hypochlorite blending plant will be constructed and a chlorine alarm system installed. The project will include the provision of appropriate instrumentation for the generation of quantitative and qualitative data necessary for a comprehensive evaluation.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET ‒‒

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Metropolitan District Commission
20 Somerset Street
Boston, Massachusetts

TITLE OF PROJECT: "Boston University Bridge Storm Water Detention and Chlorination Station"

PROJECT SITE: Cambridge, Mass.

DATE AWARDED: September 2, 1966

FEDERAL GRANT: $1,000,000

TOTAL EST. PROJ. COST: $4,345,650

PROJECT NUMBER: 11023 FAT

PPBS NO. 1102

DESCRIPTION OF PROJECT:

A detention basin will be constructed to intercept peak flows and to chlorinate waste water, as a means of reducing combined sewage overflows into the Charles River.

The project includes the construction and evaluation of a combined sewer overflow facility, designed to provide a 10-minute minimum sedimentation-detention time with an influent of 233 MGD. The chlorinated effluent will flow by gravity from the detention tanks through a 96 inch outfall pipe into the Charles River. Sludge deposits in the detention tanks will be returned to the sewer system to be treated at the sewage treatment plant. All settled materials will be flushed out of the tanks and into the sewer system after the storm subsides.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: City of Milwaukee, 841 North Broadway, Milwaukee, Wisconsin 53202

TITLE OF PROJECT: "Humbolt Avenue Overflow Detention and Chlorination Facility"

PROJECT SITE: Milwaukee, Wisconsin ***DATE AWARDED:*** October 15, 1966

FEDERAL GRANT: $1,468,589 ***TOTAL EST. PROJ. COST:*** $2,368,118

PROJECT NUMBER: 11023 FAU ***PPBS NO.*** 1102

DESCRIPTION OF PROJECT: The project will demonstrate the effectiveness of a detention tank including chlorination facilities for the treatment of combined sewer overflows from a 570 acre urban area. The tank influent will be screened. The tank will be designed to provide a minimum of 15 minutes detention time for sedimentation and chlorination. After an overflow the sludge deposits and remaining wastewater will be pumped to a nearby interceptor sewer for treatment at an existing treatment plant.

Because of the complex nature of the combined sewer system, eight in-system monitoring stations will record flows and sample the overflows.

The overflows presently discharge to the Milwaukee River, seriously impairing most beneficial water uses. Three river monitoring stations will record the dissolved oxygen and temperature, and provide for the collection of river samples to determine the effects of the proposed project on the river water quality.

All data will be analyzed to relate the effectiveness with operation and costs, inclusive of benefits received. Results will be utilized to develop a method for optimizing the design of such facilities and establish relationships to other approaches for achieving comparable results.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: East Chicago Sanitary District, East Chicago, Indiana

TITLE OF PROJECT: "East Chicago Treatment Lagoon"

PROJECT SITE: East Chicago, Indiana **DATE AWARDED:** December 23, 1966

FEDERAL GRANT: $1,044,120 **TOTAL EST. PROJ. COST:** $2,179,110

PROJECT NUMBER: 11023 FAV **PPBS NO.** 1102

DESCRIPTION OF PROJECT: Project will evaluate the effectiveness of treating combined sewer overflows in a very deep detention basin having aerobic and anaerobic levels of treatment. The aerobic treatment is accomplished by large oxygen transfer units suspended on surface of basin waters. The prime objective of the project is to demonstrate a control method to optimize the quality of treatment to storm water and combined sewage mixed with industrial waste water. This treatment will render a more acceptable discharge to the recieving waters. The demonstration will assess design criteria for detention basins to provide storage and treatment to storm water and combined sewer overflows; design requirements for large oxygen transfer units in relation to volumes of waste water and quality of effluent.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: City of Dallas
210 City Hall, Main and Harwood
Dallas, Texas 75201

TITLE OF PROJECT: "Stormwater Treatment Facilities"

PROJECT SITE: Dallas, Texas

DATE AWARDED: May 21, 1968

FEDERAL GRANT: $1,093,360

TOTAL EST. PROJ. COST: $1,488,732

PROJECT NUMBER: 11023 FAW

PPBS NO. 1102

DESCRIPTION OF PROJECT:

The project consists of the design, construction and evaluation of a facility to treat overflows from sewers carrying a mixture of domestic wastewater and infiltration stormwater. Physical features include a diversion structure, pumping station, flocculation and sedimentation basins, chemical feed facilities, and a pipeline for conveyance of waste lime sludge from the municipal water treatment plant to the overflow treatment facility.

Treatment Unit #1 will include flocculation, sedimentation and polishing treatment with tube-type clarifiers; Unit #2 will include flocculation and sedimentation; Unit #3 will include high-rate sedimentation. Effluent from the facility will be chlorinated. Design flow rate will be 28 million gallons per day.

The facility will be operated and evaluated as a demonstration project for a period of one year following completion of construction.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Contract awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR: **Dow Chemical Company**
Midland, Michigan

TITLE OF PROJECT: **"Demonstration and Evaluation of Polymeric Additives in the Treatment of Storm Water Overflow"**

PROJECT SITE: **Detroit, Michigan**

FEDERAL CONTRACT: **$700,000**

DATE AWARDED: **August 8, 1967**

PROJECT NUMBER: **14-12-9**
11023 FDB

PPBS NO: 1102

DESCRIPTION OF PROJECT:

This project involves a two year study of the use of polymeric chemicals to control pollution from combined sewer overflows. The project will be carried out at Milk River Pump Station in suburban Detroit, Michigan. This installation, which serves an area of about 3700 acres, includes a 3.5 MG detention basin. The project will include complete development of hydrological information for the demonstration area.

Flocculant studies will be carried out on both laboratory and full scale to demonstrate the effect of the use of polymeric flocculants. A demonstration of the effectiveness of disinfectants, both with and without polymers, will be completed on both pilot plant and laboratory scales.

A major part of the project will be the fabrication of a model of the existing basin. This model will be tested concurrently with the full scale basin to validate its use for model extrapolation. An optimized model will be conceived, built and tested as a design for sedimentation basins incorporating chemical flocculation.

INQUIRIES: *Contact the*

Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Avenue, N.W.
Washington, D. C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 11023 FDD (Contract No. 14-12-121)

TITLE OF PROJECT: Primary Treatment of Storm Water Overflow from Combined Sewers by High Rate Fine Mesh Screens

GRANTEE OR CONTRACTOR:
Cornell, Howland, Hayes & Merryfield
Portland, Oregon

PROJECT DIRECTOR:
S. S. Lasswell

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $139,331

Obligation Date: August 17, 1967

Total Federal Cost: $139,331

Completion Date: March 1970

FINAL REPORT:

TITLE: Rotary Vibratory Fine Screening of Combined Sewer Overflows

Abstract: The objective of this study was to determine the feasibility, effectiveness, and economics of employing high-rate, fine-mesh screening for primary treatment of storm water overflow from combined sewer systems.

The final form of the screening unit stands 63 inches high and has an outside diameter of 80 inches. The unit is fed by an 8-inch pipe carrying 1700 gpm (122 gal/min/ft^2) which is distributed to a 60-inch diameter rotating (60 rpm) stainless steel collar screen having 14 square feet of available screen area and a 165 mesh (105 micron opening, 47.1% open area). The screen is backwashed at the rate of 0.235 gallons of backwash water per 1000 gallons of applied sewage.

Based on final performance tests run on dry-weather sewage, the unit is capable of 99% removal of floatable and settleable solids, 34 percent removal of total suspended solids and 27 percent removal of COD. The screened effluent is typically 92 percent of the influent flow.

On the basis of a scale-up design of a 25 mgd screening facility, the estimated cost of treatment is 22 cents/1000 gallons. No finite cost comparisons were made with other treatment methods; however, when compared to conventional primary sedimentation, the selection of a screening facility as a treatment method is dependent on the value and availability of land, the design capacity of the treatment facility, the character of rainfall and runoff, and the available means of disinfection. It was observed that the proposed screening facility required 1/10 to 1/20 the land required by a conventional primary treatment plant.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Contract, under Section 6a(1), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)	Roy F. Weston Environmental Scientists and Engineers Lewis Lane West Chester, Pennsylvania 19380
PROJECT DIRECTOR: (Name and Address)	Micheal Neijna Roy F. Weston Lewis Lane West Chester, Pennsylvania 19380
TITLE OF PROJECT:	"Kingman Lake Recreational Area - Phase One Engineering Investigation"
PROJECT SITE:	Washington, D.C.

PROGRAM (PROJECT) NUMBER:
11023 FIX
Contract No. 14-12-829

DATE OFFERED:

DATE ACCEPTED (AWARDED):
December 29, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 12/69 Thru: 4 or 5/70 (21 weeks)	$ 137,750	$ 137,750

DESCRIPTION OF PROJECT:

This 21 week, $137,750 project will be an engineering investigation to develop design parameters and preliminary costs for the design of a combined sewer overflow treatment facility, including soils information necessary for construction. Basic quality and quantity information on the combined sewer overflows from the Northeast Boundary Trunk sewer, Washington, D.C., will be defined. Overflows from this outfall will be treated and used for recreational purposes in the Kingman Lake Recreational Area.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: City of Chippewa Falls, Wisconsin

TITLE OF PROJECT: "Utilization of a Storage Pond with Treatment for Combined Sewer Overflows"

PROJECT SITE: Chippewa Falls, Wis. **DATE AWARDED:** December 23, 1966

FEDERAL GRANT: $289,685 **TOTAL EST. PROJ. COST:** $773,984

PROJECT NUMBER: 11023 FIV **PPBS NO.** 1102

DESCRIPTION OF PROJECT:

Project includes construction of a combined storm water pumping station and storage pond, increased interceptor pumping capacity, increased interceptor pumping conduit, and final settling tank capacity, combined relief sewer and some separation. It will demonstrate the control and elimination of stormwater by passes by diverting to a storage pond for sedimentation with subsequent discharge to the waste water treatment works for both primary and secondary treatment with chlorination. The design, operation procedures, and treatment efficiency will be evaluated. Comparison with separation of storm and sanitary sewers will also be evaluated.

INQUIRIES: *Contact the*

Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-854 (11023 FLY)

TITLE OF PROJECT: "Evaluation of a New Pipe Joint System"

CONTRACTOR:

The Western Company
Research Division
2201 North Waterview
Richardson, Texas 75080

Project Site: Richardson, Texas

PROJECT DIRECTOR

Mr. R. W. Chandler
The Western Company
Research Division
2201 North Waterview Parkway
Richardson, Texas 75080

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 4, 1970

Project Cost: $54,706

Completion Date:

Federal Cost: $54,706

DESCRIPTION OF PROJECT

Design, build and evaluate a heat shrinkable sewer pipe jointing device. The tasks are: (1) feasibility investigation, (2) select the most promising materials, (3) conduct laboratory investigation to evaluate materials, (4) develop best over-all design, (5) conduct cost effectiveness study and (6) outline program for field testing. The goal is to develop a flexible, leakproof, long-lasting, easily installed and economically reasonable pipe joint. The advantages of more reliable performance and lower cost sewer pipe by eliminating bell and spigot fabrication are to be compared with cost of installations.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Demo. Grant, under Section 6(a)(1), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
City of Racine
730 Washington Avenue
Racine, Wisconsin 53403

PROJECT DIRECTOR: (Name and Address)
Honorable Kenneth L. Huck
City of Racine
730 Washington Avenue
Racine, Wisconsin 53403

TITLE OF PROJECT: "Demonstration of Screening/Dissolved-Air Flotation Treatment as an Alternate to Combined Sewer Separation"

PROJECT SITE: Racine, Wisconsin

PROGRAM (PROJECT) NUMBER: 11023 FWS

DATE OFFERED: June 16, 1970

DATE ACCEPTED (AWARDED): June 24, 1970

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From:	$ 1,394,719	$ 1,046,039
Thru:		

DESCRIPTION OF PROJECT:

A 700 acre drainage area in the City of Racine, Wisconsin, has a total of 53 outfalls on a four mile stretch of the Root River. Of these outfalls, 17 are separate storm sewers and 36 are combined sewer overflow relief points. Several outfalls will be intercepted and the flows directed to five riverside treatment units, of which three will treat combined sewage, one will treat storm water only and one will treat both. The untreated excess combined sewage and urban runoff produce high shock loads on the receiving water during rain events or snow melt. Rather than separation of the combined systems an alternate of treating the sewage by screening down to 200 microns then flocculation and flotation with pressurized dissolved-air will be demonstrated. There will also be verification of a recently developed combined sewer/water quality mathematical model.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6(a)(1)
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 11023 FWT

TITLE OF PROJECT: "Combined Sewers - Microstraining Pilot Tests"

GRANTEE:
Philadelphia Water Department
1160 Municipal Services Building
Philadelphia, Pennsylvania 19107

PROJECT DIRECTOR: (Co-Directors)
Mr. Carmen F. Guarino
Mr. Joseph V. Radziul
Municipal Services Building
Philadelphia, Pennsylvania 19107

Project Site: Philadelphia, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date:

Project Cost: $109,400

Completion Date:

Federal Cost: $82,000

DESCRIPTION OF PROJECT

This project will demonstrate further operational feasibility in treating combined sewer overflows by means of a prototype microstraining and disinfection facility. Research is directed to improving and obtaining highest operational and cost efficiency for each step of the microstraining process system. A suitable screening technique has been developed, and its performance will be evaluated at filtration rates approximating 50 gpm/ft^2 screen area. Disinfection is accomplished by chlorination and/or ozonization under high flow rates and relatively low detention times. Preliminary results indicate that the process has been successful in removing suspended solids from combined sewer overflows. BOD removals and bacterial kills will be evaluated. The project will provide design criteria, operation and maintenance guidelines, project costs, and other data necessary to proceed to full-scale treatment schemes.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-65 (11024)

TITLE OF PROJECT: The Problems of Combined Sewer Facilities and Overflows in United States Communities

GRANTEE OR CONTRACTOR:
American Public Works Association
Chicago, Illinois

PROJECT DIRECTOR:
Richard Sullivan

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $250,000 **Obligation Date:** May 17, 1967

Total Federal Cost: $250,000 **Completion Date:** December 1967

FINAL REPORT:

TITLE: Problems of Combined Sewer Facilities and Overflows -- 1967

Abstract: The effects and means of correcting combined sewer overflows and separate storm and sanitary sewer discharges were inventoried on a national basis in 1967 and compiled in this report. On-site personal interviews with the public officials of approximately 900 communities in the United States collected over 250,000 pieces of data which have been analysed and grouped by State, river basin, and population group to define the problems of combined sewer facilities and overflows. Nationwide projections were made for major items of interest including, area and population served by combined sewers, overflow locations, type and number of regulators, associated land and water uses, estimates of costs for sewer separation by States, alternate control and/or treatment methods and consideration of other aspects of the overall problem. Findings Conclusions and Recommendations are presented in summary form.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-146 (11024)

TITLE OF PROJECT: Materials to Reduce or Eliminate Infiltration into Sewerage Systems

GRANTEE OR CONTRACTOR:	**PROJECT DIRECTOR**:
The Western Company Richardson, Texas	H. R. Crawford

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $96,702	**Obligation Date**: January 1968
Total Federal Cost: $96,702	**Completion Date**: June 1969

FINAL REPORT:

TITLE: Improved Sealants for Infiltration Control

Abstract: The objective of this program was to develop new, more effective sealants for sewer line leaks (leaking joints, cracks and large holes). This purpose was achieved, and all equipments and materials investigated, tested or compared are presented, along with test results, supporting data, conclusions and recommendations. A wide range of candidate materials was surveyed, and weaknesses of rejected materials were noted. Meanwhile, specific properties of acceptable materials were ascertained and materials having these properties were identified. These latter materials were subjected to tests designed to demonstrate their effectiveness as sealants. Cost/effectiveness of the new sealant materials was compared with that of present sealant materials. It was concluded that infiltration adversely influences sewer system operating costs and effectiveness. Several sealants developed during the program were demonstrated to be able to effect strong, permanent repairs. No significant cost increase beyond that experience with present sealers was indicated. Some present sealant application equipment can be modified for use with the new materials, but new equipment designs are described and recommended. Too, long-term field tests of the materials are recommended.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET -- --

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Contract awarded under Sec. 6, Federal Water Pollution Control Act [Clean Water Restoration Act].

CONTRACTOR: Aerojet-General Corporation
9200 East Flair Drive
El Monte, California 91734

TITLE OF PROJECT: "Role of Solids in Combined Sewage Pollution"

PROJECT SITE: San Francisco, California

FEDERAL CONTRACT: $92,605.00 DATE AWARDED: June 20, 1968

PROJECT NUMBER: 14-12-180 PPBS NO: 11024

DESCRIPTION OF PROJECT:

The purpose of the twelve-month field investigation and evaluation is directed toward determination of the feasibility and potential benefits that may be obtained through the removal of solids utilizing in-sewer screening devices. Sufficient data to permit a reasonable assessment of the anticipated removals of floatables and solid material will be obtained. The effect on chlorination requirements resulting from the solids removals will be investigated. The contractor will evaluate the relationship between the aesthetic water quality considerations and proposed State Water Quality Standards for those bodies of water receiving combined sewer overflows.

INQUIRIES: Contact the Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Avenue, N.W.
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Contract awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR: Aerojet-General Corporation
Environmental Systems Division
El Monte, California

TITLE OF PROJECT: "A Method for Assessing the Extent of Pollution from Stormwater Runoff from an Urban Area"

PROJECT SITE: Sacramento, California

FEDERAL CONTRACT: $402,594.00 DATE AWARDED: June 29, 1968

PROJECT NUMBER: 14-12-197 PPBS NO: 11024

DESCRIPTION OF PROJECT:

This 15 month study will investigate the combined sewer problems in Sacramento, California. Seven potential control and/or treatment systems will be explored to determine applicability as solutions to the problems defined by field investigation. They include: high rate cyclone and air flotation treatment, rapid flow combustible filter, pressure sewers, temporary storage, deep tunnel system, stabilization ponds, and sewer separation. Preliminary plans and specifications will be prepared for each of the systems with a cost/effectiveness evaluation to measure the capability of each system to correct the pollution problems resulting from combined sewer overflows. Economic and social impact studies will be included.

A combined sewer overflow data collection and analysis program, including rainfall-runoff-quality relationships will be established at several locations.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Avenue, N.W.
Washington, D. C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-467 (11024)

TITLE OF PROJECT: Selected Abstracts of Storm Water Discharges and Combined Sewer Overflows

GRANTEE OR CONTRACTOR:
The Franklin Insitute
Philadelphia, Pennsylvania

PROJECT DIRECTOR:
Pat Devlin

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $8,946

Obligation Date: October 18, 1968

Total Federal Cost: $8,946

Completion Date: June 1969

FINAL REPORT:

TITLE: Selected Urban Storm Water Runoff Abstracts

Abstract: Selected Urban Storm Water Runoff Abstracts is a compilation of abstracts summarizing articles from a variety of technical publications, covering the subjects of urban runoff, storm water discharge, storm sewers, and combined sewers--together constituting "the problem of urban drainage". Articles on more general subjects, such as "sewerage" or "sanitary engineering", and topics not closely related to storm water, such as "agricultural runoff", have been excluded.

The present work represents an effort to index, expand and update the annotated bibliography, Storm Water Runoff from Urban Areas, issued in April 1966 by the Cincinnati Water Research Laboratory of the Federal Water Quality Administration. Among the 573 abstracts presented are 386 not previously included, which summarize articles dated both earlier and later than 1966, so that the present compilation represents as complete a bibliographic record as possible of storm water articles, up to--and to some extent including--1968. The 187 abstracts from the 1966 edition were indexed, but not otherwise edited or re-evaluated. For convenience, the abstracts are classed in eleven sub-topic categories, and arranged by abstract number within each category.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

FWQA(HQ)-9200-3 (4-70)

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-401 (11024)

TITLE OF PROJECT: Engineering Investigation of Storm and Combined Sewer Pollution at Bucyrus, Ohio

GRANTEE OR CONTRACTOR:
Burgess and Niple, Limited
Columbus, Ohio

PROJECT DIRECTOR:
Richard Noland

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $136,665

Obligation Date: June 27, 1968

Total Federal Cost: $136,665

Completion Date: November 1969

FINAL REPORT:

TITLE: Stream Pollution and Abatement from Combined Sewer Overflows Bucyrus, Ohio

Abstract: This report contains the results of a detailed engineering investigation and comprehensive technical study to evaluate the pollutional effects from combined sewer overflows on the Sandusky River at Bucyrus, Ohio and for pollution abatement from the combined sewer overflows. Bucyrus has an incorporated area of about 2,340 acres, a population of 13,000, and a combined sewer system with an average dry weather wastewater flow of 2.2 million gallons per day.

The results of the study show that any 20 minute rainfall greater than 0.05 of an inch will produce an overflow. The combined sewers will overflow about 73 times each year discharging an estimated annual volume of 350 million gallons containing 350,000 pounds of BOD and 1,400,000 pounds of suspended solids. The combined sewer overflows had an average BOD of 120 mg/1, suspended solids of 470 mg/1, total coliforms of 11,000,000 per 100 ml and fecal coliforms of 1,600,000 per 100 ml. The BOD concentration of the Sandusky River, immediately downstream from Bucyrus, varied from an average of 6 mg/1 during dry weather to a high of 51 mg/1 during overflow discharges. The suspended solids varied from an average of 49 mg/1 during dry weather to a high of 960 mg/1 during overflow discharges. The total coliforms varied from an average of 400,000 per 100 ml during dry weather to a high of 8,800,000 per 100 ml during overflow discharges.

It was concluded that the most economical method of providing a high degree of protection to the Sandusky River is by collecting the combined sewer overflows with a large interceptor and using an aerated lagoon system to treat the waste loads from the overflows.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 11024 DMS (Contract 14-12-200)

TITLE OF PROJECT: Engineering Investigation of Combined Sewer Overflow Problem

GRANTEE OR CONTRACTOR:	**PROJECT DIRECTOR:**
Hayes, Seay, Mattern & Mattern 1615 Franklin Road, S.W. Roanoke, Va. 24016	Wendle R. Snapp

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost:	$104,191	**Obligation Date:**	8/16/68
Total Federal Cost:	$104,191	**Completion Date:**	3/16/70

FINAL REPORT:

TITLE: Engineering Investigation of Sewer Overflow Problem
11024DMS 05/70

Abstract: Three study areas, representing approximately 2150 acres or 25 percent of the area served by the City of Roanoke, Virginia's separate sanitary sewerage system, were used in an analysis of stream pollution resulting from rainfall infiltration and sanitary sewer overflows.

Data from rainfall gauges were correlated with historical rainfall data to establish precipitation frequencies. Flows in the sanitary sewers and streams were gauged during storm events to measure infiltration and runoff quantities and to establish their relation to rainfall intensities and durations. Samples were obtained during storm events to assess the quality of sewer overflows and storm runoff.

Rates of infiltration in the sanitary sewers were found to be as high as 24,000 gallons per inch of pipe diameter per mile per day which produced overflows from a single storm event equivalent to 14 percent of the daily untreated sewage.

Various remedial measures were investigated and a program, based primarily on reducing infiltration by at least 80 percent, was presented. The cost would be about $61 per capita.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Contract awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR: Metcalf and Eddy, Inc.
1029 Corporation Way
Palo Alto, California 94303

TITLE OF PROJECT: TRIUMVIRATE, Storm Water Pollution Control Management

PROJECT SITE: Palo Alto, California

FEDERAL CONTRACT: $253,800 DATE AWARDED: March 4, 1969

PROJECT NUMBER: 14-12-502 (11024DOC) PPBS NO: 1102

DESCRIPTION OF PROJECT: An eighteen (18) month program to develop a comprehensive mathematical model capable of representing urban storm water runoff phenomena, both quantity and quality, from the onset of precipitation on the basin, through collection, conveyance, storage, and treatment systems, to points downstream from outfalls which are significantly affected by storm discharges. The validity of the model for simulating existing situations will be demonstrated by applying it to several storm and combined sewer drainage basins: (1) Storm sewers: 1 large and 1 small basin; (2) Combined sewers: 1 large and 1 small basin.

Development of the model is scheduled for twelve months and demonstration is for a period of six (6) months.

The Triumvirate of University of Florida, Water Resources Engineers, Inc. and Metcalf and Eddy, Inc. have joined together (under the overall coordination of Metcalf and Eddy, Inc.) to develop this working tool to assist municipalities in the management and control for storm water pollution abatement. Total project cost is $513,650.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Avenue, N.W.
Washington, D. C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 11024 DOK

TITLE OF PROJECT: Controlling Pollution from Combined Sewer Overflows and Storm Water by Electrode Potential

GRANTEE OR CONTRACTOR:	**PROJECT DIRECTOR:**
Merrimack College North Andover, Mass.	Werner Grune

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost:	$45,413	**Obligation Date:**	November 29, 1968
Total Federal Cost:	$21,563	**Completion Date:**	

FINAL REPORT:

TITLE: Proposed Combined Sewer Control by Electrode Potential

Abstract: The use of electrode potential measurements as an indicator of pollution strength and an element in a flow control system was investigated. The electrode potential method measures the effective integrated oxidation strength of the materials carried in sewage. The potential is sensitive to the strength of untreated sewage as measured by standard parameters such as BOD, COD and sulfides. However, predominant oxidants and reductants do exert a significant influence on the potential. The effect of different cell systems on the response to the electrode potential was also investigated. Immersion electrodes do polarize and while the Ag, AgCl-pt. flow-through cell is sensitive it will perform provided the flow is continuous. The Cu-pt. electrode system was found to be relatively insensitive and unstable. Dissolved oxygen causes erratic readings. Sufficient reproducibility of readings are possible in anaerobic or predominant sulfide environments. Therefore, the electrode potential indicates more accurately the age and not the strength of combined sewage.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5(a)(2)
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 11024 DQU

TITLE OF PROJECT: "Urban Runoff Characteristics"

GRANTEE:
University of Cincinnati
Cincinnati, Ohio

PROJECT DIRECTOR:
Dr. Herbert Preul
University of Cincinnati
Cincinnati, Ohio

Project Site: Cincinnati, Ohio

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 29, 1970

Project Cost: \$55,690 (first year)
\$59,854 (second year)

Completion Date:

Federal Cost: \$52,905 (first year)
\$56,596 (second year)

DESCRIPTION OF PROJECT

This second year of the project will concentrate on the verification and improvement of the basic mathematical model using the data collected as well as other available data.

The objectives of the first year of a three year research project to collect, for the first time, detailed information defining the physical characteristics of an urban drainage area tributary to a combined sewer drainage system and detailed data relating to the quantity and quality of various sources of pollution within the combined sewer drainage area has been successfully completed. Generally in the past, data have been collected only at the actual overflow location from a drainage area. The collection and evaluation of data from within the tributary drainage area will provide valuable insights regarding methods for controlling the strength and volume of combined sewer overflows.

A comprehensive stormwater management mathematical model is presently under development for predicting the quantity and quality of combined sewer overflows. The detailed data collected will be utilized for verification and utilization of this model by communities needing a working tool for development of combined sewer overflow abatement programs.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Contract awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR: American Standard Incorporated
P.O. Box 2003
New Brunswick, New Jersey

TITLE OF PROJECT: "Develop a Suspended Solids Monitor"

PROJECT SITE: New Brunswick, New Jersey

FEDERAL CONTRACT: $121,946

DATE AWARDED: March 28, 1969

PROJECT NUMBER: 14-12-494
11024 DZB

PPBS NO: 1102

DESCRIPTION OF PROJECT:

A suspended solids monitor for use in continuously measuring suspended solids in sewage will be developed and evaluated. A new principal for such measurement, based on the measurement of light depolarization, will be utilized. Phase I of the project will determine feasibility of the technique, Phase II will accomplish design of the prototype instrument, Phase III will involve selection and bench-scale testing of optical components, and electronic components will be selected in Phase IV. Phase V will consist of field standardization and calibration of the prototype in a sewage environment.

INQUIRIES: Contact the Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Avenue, N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Contract awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR: Water Resources Engineers, Inc.
1900 Olympic Boulevard
Walnut Creek, California 94596

TITLE OF PROJECT: TRIUMVIRATE, Storm Water Pollution Control Management

PROJECT SITE: Walnut Creek, California

FEDERAL CONTRACT: $114,860 DATE AWARDED: March 4, 1969

PROJECT NUMBER: 14-12-501 (11024EBI) PPBS NO: 1102

DESCRIPTION OF PROJECT: An eighteen (18) month program to develop a comprehensive mathematical model capable of representing urban storm water runoff phenomena, both quantity and quality, from the onset of precipitation on the basin, through collection, conveyance, storage, and treatment systems, to points downstream from outfalls which are significantly affected by storm discharges. The validity of the model for simulating existing situations will be demonstrated by applying it to several storm and combined sewer drainage basins: (1) Storm sewers: 1 large and 1 small basin; (2) Combined sewers: 1 large and 1 small basin.

Development of the model is scheduled for twelve months and demonstration is for a period of six (6) months.

The Triumvirate of University of Florida, Water Resources Engineers, Inc., and Metcalf and Eddy, Inc. have joined together (under the overall coordination of Metcalf and Eddy, Inc.) to develop this working tool to assist municipalities in the management and control for storm water pollution abatement. Total project cost is $513,650.

INQUIRIES: Contact the Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Avenue, N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Contract awarded under Sec. 6, Federal Water Pollution Control Act [Clean Water Restoration Act].

CONTRACTOR: University of Florida
Department of Environmental Engineering
Gainesville, Florida 32601

TITLE OF PROJECT: TRIUMVIRATE, Storm Water Pollution Control Management

PROJECT SITE: Gainesville, Florida

FEDERAL CONTRACT: $144,990 DATE AWARDED: March 11, 1969

PROJECT NUMBER: 14-12-503 (11024EBJ) PPBS NO: 1102

DESCRIPTION OF PROJECT: An eighteen (18) month program to develop a comprehensive matehmatical model capable of representing urban storm water runoff phenomena, both quantity and quality, from the onset of precipitation on the basin, through collection, conveyance, storage, and treatment systems, to points downstream from outfalls which are significantly affected by storm discharges. The validity of the model for simulating existing situations will be demonstrated by applying it to several storm and combined sewer drainage basins: (1) Storm sewers: 1 large and 1 small basin; (2) Combined sewers: 1 large and 1 small basin.

Development of the model is scheduled for twelve months and demonstration is for a period of six (6) months.

The Triumvirate of University of Florida, Water Resources Engineers, Inc. and Metcalf and Eddy, Inc. have joined together (under the overall coordination of Metcalf and Eddy, Inc.) to develop this working tool to assist municipalities in the management and control for storm water pollution abatement. Total project cost is $513,650.

INQUIRIES: Contact the Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Avenue, N.W.
Washington, D. C. 20242

INFORMATION SHEET

Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Research Grant, under Section 5a(2), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Lehigh University
Bethlehem, Pennsylvania 18015

PROJECT DIRECTOR: (Name and Address)
W. H. Graf, Associate Professor of Civil Engineering
Lehigh University
Bethlehem, Pennsylvania 18015

TITLE OF PROJECT: "Transport of Solid Suspension in Conduits"

PROJECT SITE: Bethlehem, Pennsylvania

PROGRAM (PROJECT) NUMBER:
11024 EKD

DATE OFFERED:
June 12, 1969

DATE ACCEPTED (AWARDED):
June 19, 1969

Grant or Contract Period	Eligible . Grant Period Costs	FWPCA Grant or Contract Amount
From: 7/1/69 Thru: 6/30/70	$ 41,095 (1969-70)	$ 37,000

DESCRIPTION OF PROJECT:

The objectives of this two-part project are:

1. To continue the investigation and determination of design criteria for minimum transport velocities of non-depositing solid-liquid mixtures in pipe lines.
2. To further develop a modified Venturi meter to measure mixture flow rate and concentration simultaneously.

The benefits would include improved design and operation of pressure lines for the transport of ground sanitary sewage. Such pressure lines would be used for combined sewer separation and control of overflows of combined sewage to streams, as developed by the combined sewer separation project of the American Society of Civil Engineers (FWPCA contract no. 14-12-29).

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Contract awarded under Sec. 6,(a2) Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR: Black, Crow & Eidsness
1261 Spring Street, N.W.
Atlanta, Georgia 30309

TITLE OF PROJECT: "An Engineering Investigation of Combined Sewer Problems of Atlanta, Georgia"

PROJECT SITE: Atlanta, Georgia

FEDERAL CONTRACT: $263,826

DATE AWARDED: September 5, 1968

PROJECT NUMBER: 14-12-458
11024 ELB

PPBS NO: 1102

DESCRIPTION OF PROJECT:

A detailed engineering investigation and comprehensive technical study will be carried out in the South River Drainage Basin of Atlanta, Georgia to: (1) evaluate the benefits, economics and feasibility of alternate schemes including separation, collection, storage and treatment for overflow or bypassed waste water from combined sewer systems, and the discharges of storm water collection systems, (2) correlate pollution load data with type of zoning and detailed land use and (3) develop methodology to relate storm water drainage in both quality and quantity to zoning classification.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 11024 EQE (Contract 14-12-835)

TITLE OF PROJECT: Impregnation of Concrete Pipe

CONTRACTOR:	**PROJECT DIRECTOR**
Southwest Research Institute	A. C. Ludwig

Project Site: San Antonio, Texas

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	March 10, 1970	**Project Cost:**	$50,735
Completion Date:	March 10, 1971	**Federal Cost:**	$57,735

DESCRIPTION OF PROJECT The primary objective is to investigate and evaluate the additives and coatings for concrete used in large diameted sewer pipe which will decrease the permeability and increase the chemical and bacteria resistance to deterioration while maintaining or improving the physical and mechanical properties. The optimum impregnating techniques from the cost/effectiveness viewpoint will be determined.

In addition to the existing known additive and coatings the polymer sealants developed in FWQA contract 14-12-146, "Improved Sealants for Infiltration Control", will also be evaluated under fabrication conditions. These sealants were originally developed for in-place repair of sewer pipe.

The overall approach is to tailor modifiers, additives and impregnating formulations for concrete to meet the specific performance and cost requirements of sewerage material.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET -- --

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Contract awarded under Sec. 6, Federal Water Pollution Control Act [Clean Water Restoration Act).

CONTRACTOR: Metcalf & Eddy, Inc. Engineers
1029 Corporation Way
Palo Alto, California 94303

TITLE OF PROJECT: "Engineering Investigation of the East Bay Municipal Utility District of the San Francisco Bay Area (Oakland)

PROJECT SITE: Oakland, California

FEDERAL CONTRACT: $141,300.00 DATE AWARDED: June 29, 1968

PROJECT NUMBER: 14-12-407 PPBS NO: 1102
11024 EQG

DESCRIPTION OF PROJECT:

A fifteen (15) month study to conduct an engineering investigation of sewer infiltration problems in the East Bay Municipal Utility District of the San Francisco Bay Area (Oakland). At the present time, (due to infiltration) the sanitary sewage system functions as a combined storm-sanitary system during wet weather. Sewage treatment plant flows rise to 5 times dry weather flow resulting in a great deal of by-passing. Problem areas and causes will be delineated and alternative engineering solutions will be developed, including determination of both technical and economic feasibility. Generalized cost curves will be developed for the alternates. Applicability of solutions to other areas with similar problems will be considered.

A representative data collection program will be conducted. Approximately twenty flow gaging stations, five sampling sites and a rain gage network will be utilized.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Avenue, N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Contract awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR: R. F. Weston
Environmental Science & Engineering Consultants
1426 Lewis Lane
West Chester, Pennsylvania 19380

TITLE OF PROJECT: "Develop and Demonstrate a Method for Assessing the Extent of Pollution from Storm Water Runoff in an Urban Area"

PROJECT SITE: Washington, D. C.

FEDERAL CONTRACT: $229,525

DATE AWARDED: June 29, 1968

PROJECT NUMBER: 14-12-403
11024 EXF

PPBS NO: 1102

DESCRIPTION OF PROJECT:

Roy F. Weston will conduct a twelve month study to investigate the combined sewer problems in the District of Columbia. Twenty-five square miles served by combined sewers would be included in the project area. Several alternate approaches to solution of the overflow problem will be investigated, with emphasis on chemical flocculation coupled with high-rate filtration. The "deep tunnel" storage concept will also be considered.

The Contractor will gage major streams and major overflows within the demonstration area, in conjunction with a overflow quality sampling and analysis program at selected locations.

A laboratory research program will be conducted to determine the efficiency of removing flocculated solids and associated BOD by high rate filtration of combined sewer overflows. Filtration rates of 15 or more gallons per minute per square foot are anticipated.

INQUIRIES: Contact the Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Avenue, N.W.
Washington, D. C. 20242

INFORMATION SHEET

Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Contract, under Section 6(a)(1), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Hydrospace Research Corporation
5541 Nicholson Lane
Rockville, Maryland 20852

PROJECT DIRECTOR: (Name and Address)
Dr. Charles R. Nichols
5541 Nicholson Lane
Rockville, Maryland 20852

TITLE OF PROJECT: "Sewer Flow Measurement"

PROJECT SITE: Rockville, Maryland

PROGRAM (PROJECT) NUMBER:
11024 EYD

DATE OFFERED:

DATE ACCEPTED (AWARDED):

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 2 years Thru:	$ $135,000	$135,000

DESCRIPTION OF PROJECT:

This project is to design, fabricate, test, and evaluate a prototype device for measuring wastewater flow in sewers, particularly to meet the very severe requirements for measuring and recording flows in storm sewers and in combined sewers. The objective is to develop a device which will be capable of measuring a full range of open-channel flow in a closed conduit, and flow with the conduit flowing full and under pressure. Its operation is not to be seriously affected by the movement of solids such as sand, gravel, and debris within the fluid flow, and capability for installation in confined and moisture-laden spaces such as sewer manholes is necessary. Ultimate reasonable production cost, and a 5 percent plus or minus accuracy are planned.

The prototype device is to operate on the same principle as hot-wire or hot-film anemometers, which are successfully used for measurement of gas flow and flow of "clean" water under laboratory conditions. One or more insulated electrical resistance elements or probes, will be mounted near the boundary of the sewer channel. Changes in the height and velocity of flow result in variable heat removal from the probe, as provided by conduction and convection currents in the sewage. Therefore, the temperature, or resistance, level in the probe corresponds to the height and velocity of flow in the channel.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Contract, under Section 6a(1), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Hittman Associates, Inc.
P.O. Box 810
Columbia, Maryland 21043

PROJECT DIRECTOR: (Name and Address)
Mr. John J. Boland
P.O. Box 810
Columbia, Maryland 21043

TITLE OF PROJECT: "A Portable Device for Measuring Wastewater Flow in Sewers"

PROJECT SITE: Columbia, Maryland

PROGRAM (PROJECT) NUMBER:
11024 EYS

DATE OFFERED:

DATE ACCEPTED (AWARDED):

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 21 months Thru:	$135,000	$135,000

DESCRIPTION OF PROJECT:
This project is to design, fabricate, and test an improved device for measuring wastewater flow in sewers, particularly to meet the very severe requirements for measuring and recording flows in storm sewers and in combined sewers. The objective is to develop a device which will be capable of measuring a full range of open-channel flow in a closed conduit, and flow with the conduit flowing full and under pressure. Its operation is not to be seriously affected by the movement of solids such as sand, gravel, and debris within the fluid flow, and capability for installation in confined and moisture-laden spaces such as sewer manholes is necessary. Ultimate reasonable production cost, and a 5 percent plus or minus accuracy are planned.

The device to be developed depends on the unique properties of the electrical capacitance of a sewer cross-section, with the wastewater forming a portion of the dielectric. Rate of flow is measured by introducing a tracer in the form of small air bubbles immediately upstream from the measurement electrodes. This approach is analogous to the dye dilution technique of flow measurement, but without some of the related difficulties.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Contract awarded under Sec. 6, Federal Water Pollution Control Act [Clean Water Restoration Act].

CONTRACTOR: Henningson, Durham & Richardson
3555 Fornam Street
Omaha, Nebraska 68131

TITLE OF PROJECT: "An Engineering Investigation of Storm and Combined Sewer Problems"

PROJECT SITE: Des Moines, Iowa

FEDERAL CONTRACT: $301,200.00 *DATE AWARDED:* June 28, 1968

PROJECT NUMBER: 14-12-402
11024 FEJ
PPBS NO: 1102

DESCRIPTION OF PROJECT:

This fifteen month study pertains to engineering investigations necessary to assess combined sewer overflow and stormwater discharge problems in Des Moines, Iowa with the development of recommended applicable solution. Field investigation will be utilized to pinpoint and assess existing problems. Recommended solutions will be selected from a number of alternate approaches based on cost and expected effectiveness in controlling and/or treating the discharges. Alternate solutions to be included are surge or retention basins, percolation basins, mechanical clarification facilities, utilization of flood control facilities and existing open surface channels. Preliminary estimates for sewer separation will be developed.

The contractor will conduct a stream and combined sewer sampling and analysis program, coupled with a rainfall network for development of rainfall-runoff-quality relationships.

INQUIRIES: *Contact the* Storm and Combined Sewer Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Avenue, N.W.
Washington, D. C. 20242

INFORMATION SHEET

Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Contract, under Section 6(a)(1), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Anatole J. Sipin Co.
1140 Broadway
New York, New York 10001

PROJECT DIRECTOR: (Name and Address)
Mr. Anatole J. Sipin
1140 Broadway
New York, New York 10001

TITLE OF PROJECT: "Vibratory Sewer Flow Meter"

PROJECT SITE: New York, New York

PROGRAM (PROJECT) NUMBER:
11024 FIU

DATE OFFERED:

DATE ACCEPTED (AWARDED):

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 11 months Thru:	$ 57,609	$ 57,609

DESCRIPTION OF PROJECT:

This project is to design, fabricate, and test a prototype 12-inch vibratory sewer flowmeter capable of meeting the very severe requirements for measuring and recording flows in storm sewers and in combined sewers. The objective is to develop a device which can measure a full range of open-channel flow in a closed conduit, and flow with the conduit flowing full and under pressure. Its operation is not to be seriously affected by the movement of solids such as sand, gravel, and debris within the fluid flow, and capability for installation in confined and moisture-laden spaces such as sewer manholes is necessary. Ultimate reasonable production cost, and a 5 percent plus or minus accuracy are planned.

The flowmeter to be developed will operate on the principle that the reaction of flowing material to a mechanical vibration applied to the stream boundary in a direction transverse to the direction of flow is a direct measure of mass flow rate. The essential elements are an actuator to impart a vibratory force or motion to the flowing material, and a sensor to measure the reaction.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Contract, under Section 6(a)(1), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
The Franklin Institute-Research Laboratories
Benjamin Franklin Parkway
Philadelphia, Pennsylvania 19103

PROJECT DIRECTOR: (Name and Address)
Alex Peters
(Same address as above)

TITLE OF PROJECT: "Continuous Survey of the Literature on Storm and Combined Sewers"

PROJECT SITE: Philadelphia, Pennsylvania

PROGRAM (PROJECT) NUMBER: 11024 FJE

DATE OFFERED:

DATE ACCEPTED (AWARDED): June 26, 1970

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 6/26/70 Thru: 6/26/71	$17,303	$17,303

DESCRIPTION OF PROJECT:

The Franklin Institute during this twelve (12) month literature survey will screen, abstract and index pertinent articles and documents related to the overall urban runoff pollution problem. Phase I will update the "Selected Urban Storm Water Runoff Abstracts" from July 1968 through December 1969. Phase II would provide a continuous survey during 1970. Phase III would provide a limited number of special urban runoff literature surveys. The compilation of July 68-Dec. 69 abstracts and the 1970 abstracts would be reproduced and distributed through the Research and Development Project Reports System. Urban runoff pollution includes storm water discharges, combined sewer overflows, unsewered urban runoff, and the associated effects on the receiving waters, including sediment, nutrients, pesticides, salt. etc.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 11024 FVU

TITLE OF PROJECT: "Development of a Device for Discharge Measurement Within a Sewer Pipe"

GRANTEE:
University of Illinois
Urbana, Illinois 61801

PROJECT DIRECTOR:
Dr. Harry G. Wenzel, Jr.
Department of Civil Engineering
2524 Hydrosystems Laboratory
University of Illinois
Urbana, Illinois 61801

Project Site: Urbana, Illinois

SPECIFIC DATA ABOUT THIS AWARD

Award Date:

Project Cost: $33,620

Completion Date: June 30, 1971

Federal Cost: $27,830

DESCRIPTION OF PROJECT

This award is for funding the first year of a twenty-six (26) month project having a total estimated cost of $75,605.

The overall objective is to develop a device which will be capable of continuous measurement of discharge within a sewer pipe under both open channel and full flow conditions. The device will be of such quality that it can be used for field research purposes, and will permit continuous remote sensing. It will consist essentially of a constriction placed in the sewer pipe and at least two pressure transducers. The constriction will act as a critical flow meter under open channel flow conditions, and as a modified Venturi meter when the sewer pipe flows full. The optimum geometry of the constriction and placement of the pressure transducers will be determined. Limitations of the device, including the effects of unsteady flow on its accuracy, will be studied.

The first year of the project will be devoted primarily to a theoretical analysis which will identify the optimum theoretical geometries for the device. A laboratory investigation based on the results of the theoretical study will be conducted in the second year.

Necessary modifications to geometry and transducer placement to improve calibration and operational characteristics will be made if the need is indicated by the laboratory investigation. Simulated combined sewage will be used for the final laboratory testing.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14-12-20 (11030 DNK)

TITLE OF PROJECT: System Study Design and Evaluation of Local Storage, Treatment and Reuse of Storm Water

GRANTEE OR CONTRACTOR:
Hittman Associates
Columbia, Maryland

PROJECT DIRECTOR:
John Meyer

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $197,724

Obligation Date: July 25, 1967

Total Federal Cost: $197,724

Completion Date: August 1968

FINAL REPORT:

TITLE: The Beneficial Use of Storm Water

Abstract: This report contains a discussion of the work performed in the analysis and optimization of the system; the conceptual designs of potable, sub-potable, and pollution control systems; the conceptual design of a system for controlling pollution using a "conventional design" approach, the results of the system evaluation and plans for the demonstration of the local storage, treatment, and reuse of storm. The appendices to this report include the derivations of the hydrology equations, survey reports on water usage and the public acceptance and legal aspects of reuse, design reports on the "conventional" and demonstration program, and descriptive information on packaged water treatment plants.

Storm water runoff from local areas is normally considered to be a form of wastewater. Use of storm water from surface water supplies normally occurs only after the runoff has undergone natural treatment processes and becomes a concentrated source. In this report, the local utilization of storm water runoff is referred to as "reuse" based on the normal classification as wastewater and to distinguish the type of usage from the normal use of surface water supplies.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: WA67-2 (11030 DPI)

TITLE OF PROJECT: Rapid Flow Combustible Filter

GRANTEE OR CONTRACTOR:	**PROJECT DIRECTOR**:
Rand Development Corp. Cleveland, Ohio	Bertram Raynes

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost:	$404,850	**Obligation Date**:	August 8, 1966
Total Federal Cost:	$404,850	**Completion Date**:	August, 1969

FINAL REPORT:

TITLE: Rapid-Flow Filter for Sewer Overflows

Abstract: The concept of a rapid-flow filter able to remove large, visually objectionable solids from the kinds of overflows which result from combined sewer systems, has been shown to be feasible.

In a pilot installation at the terminus of an existing urban overflow location, a filter using lump coal performed this pollution control measure with a minimum of maintenance or difficulty. What difficulty existed centered about obtaining representative samples of overflows containing the large solids the filter was intended to, and did, remove.

A preferred filter uses lump coal as the filter medium, preferable sized to three-fourths by one and one-fourth inches, free of fines, and about eight inches in depth. The overflow is directed onto the filter bed in such a manner that the filter bed is replaced; the spent bed, composed of coal and solids, is incinerated or landfilled or disposed of by whatever manner is locally in use which does not pollute the atmosphere or surface or underground waters.

The work reported herein indicates that rapid-flow filter can be used for partial treatment of sewer overflows by removing large solids to the extent of up to sixty-five percent removals. However, the potentially most valuable contribution in the work was the finding that conventional sewage sampling does not provide a representative indication of the nature of large solids content. A recommendation for an improved sampling procedure is made.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 11030 FLN

TITLE OF PROJECT: "Development of the RRL Method of Storm Sewer Design"

GRANTEE:	**PROJECT DIRECTOR:**
University of Illinois Urbana, Illinois 61801	John B. Stall Illinois State Water Survey Box 232 Urbana, Illinois 61801

Project Site: Urbana, Illinois

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 24, 1970	**Project Cost:** $64,336
Completion Date:	**Federal Cost:** $19,102

DESCRIPTION OF PROJECT

The objective of this project is to provide a catalog of actual applications on 10 urban basins in the United States of the British Road Research Laboratory method (RRL method) for the design or redesign of storm sewers.

Project personnel would travel from Urbana, Illinois, to each of about 10 selected cities to negotiate and obtain from the files of these cities records of rainfall and storm runoff measured over a period of years from an urban basin served by a sewer system. They would obtain maps of the size, location, and slope of all existing storm sewers in each urban basin; a street map of each urban basin; and an aerial photograph covering each urban basin.

All of this physical data would be processed by digital computer for each of 10 urban basins to provide suitable procedures for determining storm runoff utilizing the British RRL method. The results from these 10 basins would be generalized to aid engineering judgement in the further application of the method for the design of storm sewers or evaluation of inadequacies of existing storm sewer systems in the United States.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.

WASHINGTON D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 11031 DSL

TITLE OF PROJECT: "Demonstration Project for Temporary Detention of Storm and Conbined Sewage in Natural Underground Formations"

GRANTEE:

City of Sputh St. Paul,
Minnesota

PROJECT DIRECTOR:

Project Site: South St. Paul, Minn.

SPECIFIC DATA ABOUT THIS AWARD

Award Date: July 22, 1968

Project Cost: $380,000

Completion Date:

Federal Cost: $285,000

DESCRIPTION OF PROJECT

Natural permeable underground strata in the South St. Paul area will be used to demonstrate their capacity for the temporary storage of both storm water and combined storm water and sewage during periods of storm runoff. Deposits of alluvium, or gravel, which are approximately 100 feet in depth are to be located for this purpose by drilling in favorable locations Prior to introduction of the waste waters into the ground, they must be treated by removal of suspended solids, and will be chlorinated, if necessary, to eliminate danger of contaminating adjacent sources of water sources of water supply. The capacity for rapid pre-treatment and movement of large volumes of waste water into the ground must be demonstrated if the system is to prove feasible.

Waste water thus entering the ground during storms will be pumped out over a period of several months. It the quality of this water meets the required standards, it can be returned to the streams. Otherwise, it will be transported to the sewage treatment plant.

Prior to introduction of waste water into the underground formation, city water will be used to test the direction, rate of movement, and quality of water in the ground through use of observation wells.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION   DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

Date to be Released

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Grant, under Section 6a1, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address) The City of LaSalle, Illinois

PROJECT DIRECTOR: (Name and Address)
Chamlin and Associates
3017 Fifth Street
Peru, Illinois 61354

TITLE OF PROJECT: "The Construction and Technical Evaluation of the Various Aspects of an Aluminum Storm Sewer System"

PROJECT SITE: LaSalle, Illinois

PROGRAM (PROJECT) NUMBER:
11032DTI

DATE OFFERED:
June 13, 1969

DATE ACCEPTED (AWARDED):
June 23, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 6/23/69 Thru: 11/23/72	Total $958,068 $ Eligible $476,368	$ 432,276

DESCRIPTION OF PROJECT:

The City of LaSalle will demonstrate the correction of combined sewer overflow problems by constructing a separate storm drainage system for a portion of the city. Engineering study indicates that this is the most economical solution for LaSalle. The development and demonstration aspects will be:

(a) The installation and evaluation of performance, durability and dependability of various size corrugated aluminum pipe, (b) prototype development and evaluation of improved joint couplers, tapping saddles, catch basins and manholes, (c) a detailed cost analysis to allow comparison of aluminum pipe with commonly used sewer material, and (d) a construction practice evaluation for future installation guidance.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 11034 FKL (Contract 14-12-187)

TITLE OF PROJECT: Develop the Relation Between Land-Use Practices and Incidence of Pollution in Urban Storm Water

GRANTEE OR CONTRACTOR:
AVCO-Economic Systems Corporation
1025 Connecticut Avenue
Washington, D.C. 20036

PROJECT DIRECTOR:
Jerry Cleveland

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $119,281

Obligation Date: June 13, 1968

Total Federal Cost: $119,281

Completion Date: February 17, 1970

FINAL REPORT:

TITLE: Storm Water Pollution from Urban Land Activity
11034FKL 07/70

Abstract: An investigation of the pollution concentrations and loads from storm water runoff in an urban area was conducted in Tulsa, Oklahoma. The scope of the project included: a field assessment of the storm water pollution by obtaining samples of the water resulting from precipitation and surface runoff from selected test areas within the metropolitan area; development of an analytical procedure for correlation of storm water pollution with selectively defined variables of land uses, environmental conditions, drainage characteristics, and precipitation; and development of a plan for implementing remedial measures necessary to abate or control sources of pollution in an urban area.

Storm water runoff samples were collected from 15 "discrete" test areas in the Tulsa metropolitan area for laboratory analysis in terms of quality standards for BOD, COD, TOC, organic Kjeldahl nitrogen, soluble orthophosphate, chloride, pH, solids, total coliform, fecal coliform, and fecal streptococcus pollutants.

Selected land use parameters, environmental conditions, drainage and precipitation data, along with storm water pollution factors provided input data for functional relationships to enable assessment of pollution from storm water runoff.

Recommendations were made for a plan of action for preventing and controlling storm water pollution from urban areas.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 11034 FLU (Contract 14-12-861)

TITLE OF PROJECT: Flow in Long Vertical Conduits with Reference to Design of Storm Water Drop Shafts

CONTRACTOR:
University of Minnesota
St. Anthony Falls Hydraulic Laboratory

PROJECT DIRECTOR
Dr. Alvin G. Anderson

Project Site: Minneapolis, Minnesota

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 5, 1970

Project Cost: $41,372

Completion Date: May 5, 1971

Federal Cost: $41,372

DESCRIPTION OF PROJECT With the advent of tunnel storage and transport of sewage the problems of maximizing flows and preventing cavitation in the vertical dropshafts have become of first order economic and technical magnitude. The primary objective of this contract is to provide design data for a large-scale model and study. The intent is to investigate at the laboratory level a small-scale model to determine the characteristics of the flow and provide design data for a large-scale model. The large-scale model, to be constructed later, will approximate in size the prototype downshaft. In addition to design consideration, if agreement and reproducibility can be obtained between the models then greater confidence in the extrapolation of these data to the prototype will be achieved.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section
Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 11034 FUJ

TITLE OF PROJECT: "Water Pollution Effects of Street Surface Contaminants"

CONTRACTOR:	**PROJECT DIRECTOR**
URS Research Company 1811 Trousdale Drive Burlingame, California 94010	Mr. Myron B. Hawkins 1811 Trousdale Drive Burlingame, California 94010

Project Site: Burlingame, California

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 30, 1970

Project Cost: $240,205

Completion Date:

Federal Cost: $240,205

DESCRIPTION OF PROJECT

The purpose of this project is to investigate and define water pollution impacts of urban surface runoff and to develop alternate approaches to be applied in abating pollution from this source. Principal project objectives are: (1) determination of the current state-of-the-art related to street cleaning equipment and practice applicable to water pollution control, (2) thorough delineation of the problem, (3) development of means of assessing extent and significance of pollutional materials not usually captured with conventional sampling, (4) development of a standard technique or procedure which can be utilized for assessing the performance of equipment and practice in terms of water pollution control and (5) development of a critical path delineation of tasks to be performed in accomplishing improvements in equipment and public works practices that will improve street cleaning practice so as to significantly reduce the water pollution impact of urban storm water discharges. Feasibility of applying mathematical modelling in this area will be determined.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 11040 DRS

TITLE OF PROJECT: "Rainfall-Runoff Relations on Urban and Rural Areas"

GRANTEE:
The Regents of the
University of Michigan
3014 Administration Bldg.
Ann Arbor, Michigan 48104

PROJECT DIRECTOR:
Prof. E. F. Brater
Dept. of Civil Engrg.
University of Michigan
304 W. Engineering Bldg.
Ann Arbor, Michigan
48104

Project Site: Ann Arbor, Michigan

SPECIFIC DATA ABOUT THIS AWARD

Award Date: July 8, 1970

Project Cost: $22,271 (1970-71)

Completion Date:

Federal Cost: $21,158

DESCRIPTION OF PROJECT

This grant provides funds for the second year of a three-year project having a total cost of $63,388.

Objectives of the project are to gain a better understanding of the factors which control the relationship between storm rainfall, or snowmelt, and the resulting storm runoff, and to determine the effect of urbanization on this runoff process. The benefits would include prevention of flood damage by means of improved design of storm sewers and waterways, and would provide data needed for the improved design and operation of facilities for control of pollution due to storm water and/or combined sewage.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION   DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b) Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Chemical Separations Corporation
Bus Terminal Road
Oak Ridge, Tennessee 37830

TITLE OF PROJECT: Acid Pickle Liquor Wastes Treatment Utilizing Advanced Ion Exchange Techniques

PROJECT SITE: Oak Ridge, Tennessee

DATE AWARDED: December 20, 1967

FEDERAL GRANT: \$50,400.00

TOTAL EST. PROJ. COST: \$72,000.00

PROJECT NUMBER: WPRD 41(R1)-01-68

PPBS NO. 1201

DESCRIPTION OF PROJECT:

The purpose of this grant is to determine the feasibility of using continuous ion exchange to strip Fe from pickling wastes and regenerate the acid for reuse. The iron will be converted to a high grade Fe_2O_3 for use in metallurgical processing as by-product.

Project Period: 15 months

INQUIRIES: **Contact the** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

ELD 8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b), Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: RAI Research Corp.
36-40 37th Street
Long Island City, N.Y. 11101

TITLE OF PROJECT: "Treatment of Cyanide Rinse Waters by Electrodialysis"

PROJECT SITE: Long Island City, N.Y **DATE AWARDED:** Nov. 11, 1968

FEDERAL GRANT: $58,685 **TOTAL EST. PROJ. COST:** $83,835

PROJECT NUMBER: WPRD-270-01-68 **PPBS NO.** 1201
12010 DFS PROJECT PERIOD: 11/11/68 to 1/1/70

DESCRIPTION OF PROJECT: This project provides for a laboratory study of the application of electrodialysis to the treatment of a cyanide solution which simulates the rinse water from a copper "strike" electroplating operation. The objective is to develop design parameters and to define economic factors as a basis for a later demonstration program with an industrial plating firm.

INQUIRIES: ***Contact the*** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

ELD/6-68

INFORMATION SHEET

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS I Grant *awarded under Section* 5 *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Metals and Metal Products
TITLE of PROJECT : Metal Removal/Recovery from Polluted Water by Complexation with Linear Polyelectrolytes
PROJECT SITE : Potsdam, New York

GRANTEE or CONTRACTOR
: Clarkson College of Technology
Potsdam, New York 13676

PROJECT DIRECTOR
: Dr. H. H. G. Jellinek
Chemistry Department
Clarkson College of Technology

PROGRAM NUMBER
12010 DHP; 2nd year

GRANT or CONTRACT NUMBER
:

TOTAL ESTIMATED COST
: $30,780

GRANT or CONTRACT AMOUNT
$ 27,086 *or* 88.0 *%*
of eligible project costs.

PROJECT PERIOD
Months : 12 months
From : March 1, 1970
To : March 1, 1971

DESCRIPTION of PROJECT :

During the first year several synthetic and natural systems were found to be effective in removal of metal ions from simulated plating rinse waters. The second year will provide for (a) continuation of the search for more and better natural systems, (b) testing of systems on actual waste solutions from industry, (c) analysis of systems for yields, ease and speed of filterability, reuse of polyelectrolyte, efficiency of removal/recovery, loss of materials, and determination of complex stability constants and (d) determination of the details of processes suitable in practice for various metal industries.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
LRDWKR 5/70 *Washington, D.C. 20242*

INFORMATION SHEET--

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Research Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: University of Utah
Salt Lake City, Utah
Dr. Jan D. Miller

TITLE OF PROJECT: Depression of Pyrite in Sulfide Flotation Systems Without the use of Cyanide

PROJECT SITE: Salt Lake City, Utah

DATE AWARDED: January 29, 1969

FEDERAL GRANT: $12,663.00

TOTAL EST. PROJ. COST: $13,559.00

PROJECT NUMBER: 12010 DIM

PPBS NO. 1201

Date Effective: January 1, 1969

DESCRIPTION OF PROJECT:

The objective of this project is to develop a technique for the depression of pyrites in the froth flotation of sulfide ores by the addition of organic salts in place of commonly used cyanides. The oxidation potential of pure systems will be varied to determine explicitly the conditions which must be imposed to depress pyrites. Batch flotation tests on two natural sulfide ores containing pyrite will then be conducted to determine the feasibility of pyrite depression in a natural system under conditions prescribed for the pure system.

INQUIRIES: Contact the Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

RN 11/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b), Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: The Beaton and Corbin Mfg. Co.
Southington, Connecticut

TITLE OF PROJECT: Chemical Treatment of Plating Waste for Elimination of Chromium, Nickel and Metal Ions

PROJECT SITE: Southington, Conn. **DATE AWARDED:** June 3, 1968

FEDERAL GRANT: $37,250 **TOTAL EST. PROJ. COST:** $58,220

PROJECT NUMBER: WPRD 244-01-68
12010 DMF **PPBS NO.** 1201

DESCRIPTION OF PROJECT: This is an industrial waste treatment project for the installation and demonstration of a chemical pre-rinse system for the removal of toxic materials from the wastes from a small electroplating plant. The treated effluent is expected to have a pH of 6.5 to 8.5 and will contain less than: 0.1 ppm of chromium, copper, nickel, or zinc; 100 ppm of chlorides or nitrates; 200 ppm of sulfates; 5 ppm of BOD; and will be color and odor free. Approximately two-thirds of the treated effluent will be reused for plating rinse water.

Precipitates of toxic metal ions will be produced by the chemical treatment of the segregated waste streams from the various plating lines. Sludges containing these precipitates will be routed to sludge drying beds. Dried sludges will be disposed of by landfill.

There are over three thousand similar sources of stream pollution in the New England area alone and over twelve thousand plating plants across the nation. This project will provide technical and economic data on an effective waste treatment method. It is anticipated that this information will be of value to many firms, who because of insufficient funds, could not themselves undertake the engineering and development costs required.

PROJECT PERIOD: June 3, 1968 to February 3, 1970

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible] Indiana Ave. N.W.~~
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b) Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: CF&I Steel Corporation
P. O. Box 1920
Denver, Colorado 80201

TITLE OF PROJECT: Research Study of Coal Preparation Plant and By Product Coke Plant Effluents

PROJECT SITE: Pueblo, Colorado

DATE AWARDED: MAR 27 1969

FEDERAL GRANT: $86,500.00

TOTAL EST. PROJ. COST: $205,000.00

PROJECT NUMBER: 12010 DNF

PPBS NO. 1201

PROJECT PERIOD: March 27, 1969 to August 1, 1970

DESCRIPTION OF PROJECT:

This project will provide for (a) a study of waste sources, volumnes, and characteristics, (b) laboratory and bench scale studies of alternate treatment processes, and (c) a study of additions to planned coal washery filtration facilities to develop reuse possibilities of non-coking solids and solids waste disposal. Development of methods for waste water treatment to produce effluents suitable for reuse or discharge in accordance with state stream standards will be a major objective.

INQUIRIES: Contact the Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12010 DOT

TITLE OF PROJECT: Detoxication of Cyanide Wastes by Electroxidation

GRANTEE: University of Waterloo
Waterloo, Ontario, Canada

PROJECT DIRECTOR: Dr. J. J. Byerley

Project Site: Waterloo, Ontario, Canada

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 1, 1970	Project Cost: $10,600 (2nd yr.)
Completion Date: May 1, 1971	Federal Cost: $10,065 (2nd yr.)

DESCRIPTION OF PROJECT

This grant provides for a continuation of the investigation of the fundamentals of the electroxidation of cyanide in plating room rinse waters and for the development, design, construction, and test operation of a 2gpm demonstration unit on simulated cyanide wastes; on typical copper, cadmium, and brass cyanide plating rinse waters (40-150 ppm total cyanide); and on mixed plating room effluents also containing hexavalent chromium, nickel, and sulfates.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6 (b) *Federal Water Pollution Control Act (Clean Water Restoration Act).*

GRANTEE: Volco Brass and Copper Company
Kenilworth, New Jersey 07033

TITLE OF PROJECT: "Treatment Recovery, and Reuse of Copper Wire Mill Pickling Wastes."

PROJECT SITE: Kenilworth, N. J. **DATE AWARDED:** June 28, 1968

FEDERAL GRANT: $124,000 **TOTAL EST. PROJ. COST:** $177,159

PROJECT NUMBER: WPRD 237-01-68 **PPBS NO.** 1201
12010 DPF PROJECT PERIOD: 6/28/68 to 9/1/70

DESCRIPTION OF PROJECT: Volco Brass and Copper Company produces 75 TPD of copper and copper alloy wire. Wastes from the pickling, bright dipping, and drawing operations consist of spent treating solution dumps, drag-out, and rise waters containing acids; alkalies; and hexavalent chromium, copper, fluoride, and copper complexing ammonium ions. Lancy Laboratories has designed a process and waste treatment system which will recover the copper electrolytically, will regenerate the treating solutions, and will permit reuse of 95+% of the waste water as process water. The process is free of any significant sludge disposal problem. The project is to be completed in one year.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible] Indiana Ave. N.W.~~.
Washington, D. C. 20242

ELD 5/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6 (b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Interlake Steel Corporation
310 South Michigan Avenue
Chicago, Illinois 60604

TITLE OF PROJECT: Pollution Control of Blast Furnace Gas Washer Through Recirculation

PROJECT SITE: Chicago, Illinois *DATE AWARDED:* January 27, 1969

FEDERAL GRANT: $175,200. *TOTAL EST. PROJ. COST:* $525,600.

PROJECT NUMBER: WPRD 208-01-68
12010 DRE
PPBS NO. 1201

DESCRIPTION OF PROJECT: The full scale demonstration project will provide additional facilities for the treatment and reuse of 7.2 mgd of blast furnace gas washer water from the venturies and coolers on two blast furnaces. The water before treatment contains 700 ppm of suspended solids, 1630 ppm of total solids, 3ppm cyanides, and 100 ppb of phenols. An aniomic polyelectrolyte will be used to improve recovery of magnetite ($Fe3^{04}$) and removal of cyanides in the primary clarifier. In addition, polyphosphates and chlorine will be used as required to prevent a hydrogen cyanide hazard in the vacinity of the cooling tower. A new cooling tower will reduce the water temperature and further reduce cyanides thus permitting reuse of most of the water. The cooling tower blowdown will be used to cool slag. The blowdown stream will be evaporated and leave its dissolved solids on the slag pile. The blowdown rate will be determined by the allowable alkalinity of the recirculated water. The water is passed through cooling coils in the walls of the blast furnaces before routing through the venturies. This is expected to limit the alkalinity to 500 ppm.

The project period of 18 months is based on anticipated completion of construction in July 1969 and Final Report by August 1, 1970.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W~~.
Washington, D. C. 20242

ELD 11/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6 b, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Minnesota Pollution Control Agency
717 Delaware Street, Southeast
Minneapolis, Minnesota 55440

TITLE OF PROJECT: "Study of Reverse Osmosis for Treating Metal Finishing Effluents"

PROJECT SITE: Minneapolis, Minnesota **DATE AWARDED:** June 30, 1969

FEDERAL GRANT: $49,737.00 **TOTAL EST. PROJ. COST:** $71,053.00

PROJECT NUMBER: 12010 DRH **PPBS NO.** 1201

DESCRIPTION OF PROJECT: The Minnesota Pollution Control Agency proposes to engage the North Star Research and Development Institute (3100 Thirty Eighth Ave., So., Minneapolis, Minnesota, 55406) to conduct Phase I of an anticipated three phase - three year project. The objectives of the project are to develop reverse osmosis (RO) for the treatment of metal finishing effluents (MFE) for the purposes of (a) eliminating pollutants from effluents, (b) recovery of valuable plating materials, and (c) recovery of waste waters for reuse.

Phase I will provide for screening of candidate membranes for effectiveness and compatibility in single ion applications, compatibility of support materials, investigation of promising membranes for improvement by modification, and investigation of operating parameters, e.g. temperature, pressure, thickness, strength, and permeability.

Phase II would extend the studies to mixed ion MFE's, life studies, and production aspects and costs of membranes.

Phase III would consist of scale-up studies on simulated MFE's and subsequently to actual MFE's with generation of data for commercialization.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

ELD 4/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6 (b), *Federal Water Pollution Control Act (Clean Water Restoration Act).*

GRANTEE: **S. K. Williams Company**
2370 N 32nd Street
Milwaukee, Wisconsin 53210

TITLE OF PROJECT: **"Electroplating Waste Treatment and Water Reuse"**

PROJECT SITE: **Milwaukee, Wisconsin** *DATE AWARDED:* July 17, 1968

FEDERAL GRANT: **$87,750** *TOTAL EST. PROJ. COST:* **$157,306.80**

PROJECT NUMBER: **WPRD222-01-R1-68** *PPBS NO.* **1201**
12010 DSA

DESCRIPTION OF PROJECT: **The S. K. Williams Company proposes to install a chemical pre-rinse type waste treatment plant (designed by Lancy Laboratories) to treat the drag-out from various operations in their new job-plating plant. Each section of the waste treatment facility will be expected to alternately or simultaneously treat the wastes from three to seven different processing operations. Sludges will be disposed of by landfill and 80-90% of the rinse waters will be reused. The blowdown rinse waters will be free of significant quantities of toxic substances.**

The project period will be 8 months for construction and 12 months for operation, maintenance, and post construction studies and reports.

INQUIRIES: Contact the Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

ELD/6-68

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR ~~CONTRACTOR~~: Weirton Steel Division
(Name and Address)
National Steel Corporation
Box 431
Weirton, West Virginia 26062

PROJECT DIRECTOR: William M. Smith
(Name and Address)
Manager, Industrial Hygiene Engineering
Weirton Steel Division

TITLE OF PROJECT: Combined Steel Mill and Municipal Wastewaters Treatment

PROJECT SITE: Weirton, West Virginia

PROGRAM (PROJECT) NUMBER: 12010 DTQ

DATE OFFERED: July 14, 1969

DATE ACCEPTED (AWARDED): July 30, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 7/30/69 Thru: 7/29/70	$ 163,963	$ 95,918

DESCRIPTION OF PROJECT:

This grant supports Phase I of grantee's anticipated three phase project to provide an overall waste treatment system to treat effluents from an integrated steel mill and the domestic wastes from the City of Weirton, West Va. The mill produces the full spectrum of steel industry wastes. Waste water volumes currently are 226 mgd and 1.2 mgd from the mill and the city respectively. The general approach will be to reduce volumes by providing treatment to maximize reuse, to provide pretreatment as required for subsequent combined treatment, to provide combined treatment of sanitary and specific mill wastes where a synergestic effect can be anticipated, in an expanded municipal facility, and to provide complete treatment of the remaining wastes.

Phase I consists of three tasks which include wastewater characterization and analysis of existing facilities, accessment of alternative treatment processes, and determination of the feasibility of a joint municipal-industrial waste treatment demonstration facility. Phase I will require twelve months to complete.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

ELD/6/69

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6b, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Armco Steel Corporation
Middletown, Ohio

TITLE OF PROJECT: "Treatment of Acid Rinse Waters"

PROJECT SITE: Middletown, Ohio

FEDERAL GRANT: $547,500

TOTAL EST. PROJ. COST: $1,784,800

PROJECT NUMBER: WPRD 168-01-68
12010 DUL

PPBS NO. 1201

PROJECT PERIOD: Nov. 1, 1967 to Nov. 1, 1970

DESCRIPTION OF PROJECT:

The project provides for construction, operation, tests, and reports on facilities to treat 1500 gpm of acid rinse waters produced by the hydrochloric acid pickling of strip-steel preparatory to cold-rolling. The treatment process will consist of limestone neutralization, aeration, coagulation, sedimentation, sludge recirculation, vacuum filtration of the excess sludge, and effluent equalization.

All or nearly all of the acid and the compounds of iron will be removed by the treatment process. The chloride content of the waste is not changed by this process and may be such that dilution with other available wastes will be required in order to meet the state's proposed standards regarding total dissolved solids.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~*633 Indiana Ave. N.W.*~~
Washington, D. C. 20242

ED/Feb.'68

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
American Iron & Steel Institute
150 East 42nd Street
New York, New York 10017

PROJECT DIRECTOR: (Name and Address)
John E. Barker
Manager, Pollution Control
Armco Steel Corporation
Middletown, Ohio 45042

TITLE OF PROJECT: "Biological Removal of Carbon and Nitrogen Compounds from Coke Plant Wastes"

PROJECT SITE: Houston, Texas

PROGRAM (PROJECT) NUMBER: 12010 EDY

DATE OFFERED: May 21, 1969

DATE ACCEPTED (AWARDED): June 25, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 6/25/69 Thru: 9/24/70	$156,000	$109,200

DESCRIPTION OF PROJECT:

The Armco Steel Corporation, under the sponsorship of the AISI and with the assistance of the AISI Fellowship at Mellon Institute will design, construct, operate, optimize, and evaluate a 1 gpm pilot facility for the three stage biological treatment of raw ammoniacal liquors from the by-product coke plant of Armco Steel located at Houston, Texas. A typical analysis of this waste would indicate 1240 ppm of phenol, 60 ppm cyanide, and 6400 ppm ammonia. The three stage biological treatment system is designed to accomplish (a) oxidation of carbonaceous material (aerobic), (b) nitrification of nitrogenons compounds (aerobic) and (c) nitrate reduction to nitrogen gas (anaerobic). Laboratory testing indicates that removal of 75% of organic carbon, 99% of phenol and cyanide and essentially all of the ammonia can be expected. The pilot facility will provide the basis for the design of a full scale facility.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

ELD 5/69

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant (s) *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Metals & Metal Products
TITLE of PROJECT : An Investigation of Techniques For the Removal of Chromium and Cyanides from Electroplating Wastes.
PROJECT SITE : Columbus, Ohio

GRANTEE or CONTRACTOR	*PROJECT DIRECTOR*
: Metal Finishers' Foundation 248 Lorraine Avenue Upper Montclair, N. J. 07043	: G. R. Smithson Bettelle Memorial Institute Columbus, Ohio 43201
PROGRAM NUMBER : 12010 EIE	*GRANT or CONTRACT NUMBER* : WPRD 201
TOTAL ESTIMATED COST : 28,140.90	*PROJECT PERIOD* *Months :* 12 months
GRANT or CONTRACT AMOUNT *$* 19,698.63 *or* 70 *%* *of eligible project costs.*	*From :* 1 Nov. 1969 *To :* 1 Nov. 1970

DESCRIPTION of PROJECT : This supplemental grant award is for the purpose of completing the research work on the carbon adsorption technique for removal of cyanide from plating wastes and for construction, testing, evaluation, and reporting on a demonstration facility in a small plating shop.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
LRDWKR 4 /70 *Washington, D.C. 20242*

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V, under Section 6(b) of the Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Alabama Water Improvement Commission
State Office Building
Montgomery, Alabama 36104

PROJECT DIRECTOR: (Name and Address)
R.E. Lacey, Head, Membrane Processes Section
Southern Research Institute
Birmingham, Alabama 35205

TITLE OF PROJECT: Electromembrane Process for Regenerating Acid from Spent Pickle Liquor

PROJECT SITE: Birmingham, Alabama

PROGRAM (PROJECT) NUMBER: 12010 EQF

DATE OFFERED: August 14, 1969

DATE ACCEPTED (AWARDED): Sept. 9, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: One Year Thru:	$30,000	$ 20,000

DESCRIPTION OF PROJECT:

This project provides for the experimental investigation of an electromembrane process for the recovery of sulfuric acid and iron or iron oxide from spent sulfuric acid pickling liquors. The investigation will determine the technical feasibility of the process in a bench scale operation, provide engineering data for the design of larger recovery units, and develop engineering cost estimates to indicate the economic feasibility of the process. The bench scale studies will be directed at development of the configuration, mode, and conditions of operation required to minimize power requirements.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

ELD 8/69

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b) Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Armco Steel Corporation
Middletown, Ohio

TITLE OF PROJECT: Treatment of Waste Water - Waste Oil Mixtures

PROJECT SITE: Ashland, Kentucky

FEDERAL GRANT: $209,000

TOTAL EST. PROJ. COST: $1,541,720

PROJECT NUMBER: WPRD 169-01-68
12010 EZV

PPBS NO. 1201

PROJECT PERIOD: Nov. 1, 1967 to May 1, 1970

DESCRIPTION OF PROJECT:

This project provides for design, operation, studies, and reports on a full scale demonstration facility to be built by Armco for the treatment of 4.6 mgd of oil-water emulsion wastes from a five-stand cold-rolling mill. A five chemical treatment method of coagulation, flocculation, dissolved air flotation for oil-water separation, and sludge incineration will be used. The project schedule provides one year for construction and one year for operating studies of parameters and reporting of results.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

ELD/Feb 68

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Metals & Metal Products

TITLE of PROJECT : Recovery of Sulfuric Acid and Ferrous Sulfate From Waste Pickle Liquor

PROJECT SITE : Youngstown, Ohio

GRANTEE or CONTRACTOR
: The Fitzsimons Steel Co., Inc.
P. O. Box 1469; 1623 Wilson Ave.
Youngstown, Ohio 44501

PROJECT DIRECTOR
: William Thornton
The Fitzsimons Steel Co., Inc.

PROGRAM NUMBER
: 12010 FNM

GRANT or CONTRACT NUMBER
: -

TOTAL ESTIMATED COST
: $143,998

GRANT or CONTRACT AMOUNT
$39,056.50 *or* 70 *%* *of eligible project costs.*

PROJECT PERIOD
Months : 26 months
From : March 23, 1969
To : May 23, 1971

DESCRIPTION of PROJECT :

This grant provides for the engineering plans, installation, operation, testing, evaluation and reporting on a full-scale facility for the elimination of 55,000 gallons per month of spent sulfuric acid pickle liquor discharge. A vacuum cooling-crystallization system will remove ferrous sulfate and concentrate the remaining acid solution for recycle to the pickling tanks. Processes for recycle or treatment of the acid rinse waters and for conversion of ferrous sulfate to other more marketable products will be evaluated. John N. Cernica & Associates, Consulting Engineers, will direct the studies and evaluations and prepare reports.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
Washington, D.C. 20242

✓
LRDWKR 4/70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS I Contract *awarded under Section* five *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

INDUSTRIAL CODE: Metals & Metal Products

TITLE of PROJECT: A Review of Water Pollution Control Practices and Problems in the Nonferrous Metals Industries.

GRANTEE or CONTRACTOR
: Battelle Memorial Institute
505 King Avenue
Columbus, Ohio 43201

PROGRAM NUMBER
: 12010 FPK

TOTAL ESTIMATED COST
: $72,500

GRANT or CONTRACT AMOUNT
$68,060 or 95%

PROJECT DIRECTOR
: G. R. Smithson
Chief, Minerals & Metallurgical
Waste Technology Division, BMI

PROJECT SITE
Columbus, Ohio

PROJECT PERIOD
Months: 9 months
From : June 25, 1970
To : March 25, 1971

DESCRIPTION of PROJECT:

Baseline data on water pollution problems and R&D needs related to domestic mining, ore concentration and reduction, and metal extraction operations in the nonferrous metals industries will be obtained. The industries to be studied will be grouped as follows: (a) copper, lead, zinc, and cadmium, (b) aluminum and magnesium, (c) nickel and cobalt, and (d) minor metals, e.g., molybdenum, beryllium, manganese, etc.

Direct Inquires to: ***Industrial Pollution Control Branch, Rm. 824***
✓ ***Federal Water Pollution Control Administration***
LRDWKR 4/70 ***Washington, D.C. 20242***

INFORMATION SHEET - - -

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R & D Contract awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR: C. W. Rice and Company
15 Noble Avenue
Pittsburgh, Pa. 15205

TITLE OF PROJECT: Cost-Effectiveness of Industrial Waste Water Treatment Practices

PROJECT SITE: above

DATE AWARDED: June 28, 1968

FEDERAL CONTRACT: $56,250

TOTAL PROJ. COST: $56,250

PROJECT NUMBER: 14-12-435

PPBS NO: 1202

BRANCH CHIEF:

PROJECT OFFICER:

DESCRIPTION OF PROJECT:

This contract is to obtain estimates of the total expenditures required by specific chemical industries during the next five years to meet (a) state water quality standards and (b) a high percentage removal of each specific pollutant including thermal pollution. The industries covered will include those in the Standard Industrial Categories 2813, 2814, 2815, 2818, and 2871 (Ammonia and Urea only).

The project is scheduled to be completed in October, 1968.

INQUIRIES: Contact the Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted].
Washington, D.C. 20242

ELD 8/68

INFORMATION SHEET--

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Union Carbide Corp.
R&D Department
Bound Brook, New Jersey 08805

TITLE OF PROJECT: Anaerobic Treatment of Synthetic Organic Wastes

PROJECT SITE: South Charleston, W.Va.

DATE AWARDED: December 11, 1968

FEDERAL GRANT: $220,400

TOTAL EST. PROJ. COST: $314,859

PROJECT NUMBER: 1202-DIS

PPBS NO. 1202

DESCRIPTION OF PROJECT: To determine the technical and economic feasibility of an anaerobic-aerobic process for the treatment of composit organic chemical wastes from a complete petrochemical complex. Optimum results will be demonstrated on a 5000 gpd scale treatment facility to obtain design data and establish operating criteria for larger scale installations. The demonstration will be conducted subject to a technical an economic feasibility study based on laboratory scale research studies. The project will be for a two year period and will be initiated at the Union Carbide Technical Center at South Charleston, West Virginia.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~*633 Indiana Ave. N.W.*~~
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: B. F. Goodrich Chemical Company
3135 Euclid Avenue
Cleveland, Ohio 44115

TITLE OF PROJECT: Waste Treatment Facilities for Poly Vinyl Chloride Manufacturing Plant

PROJECT SITE: Salem County, N. J. **DATE AWARDED:** JUL 2 1968

FEDERAL GRANT: $364,900 **TOTAL EST. PROJ. COST:** $823,100

PROJECT NUMBER: WPRD 248-01-68
12020 DJI
PPBS NO. 1202

DESCRIPTION OF PROJECT: A development, demonstration, and evaluation project for the bio-chemical treatment of wastewaters from a typical poly vinyl chloride manufacturing plant, at a 0.85 mgd scale of operation.

The treatment system is to produce effluent to meet the receiving water standards (Delaware River) of greater than 85% removal of BOD, turbidity of not greater than 30 units above river water, and be free from taste and odor producing substances.

The process will consist of chemical pre-treatment with primary sedimentation, followed by activated sludge secondary treatment and a final polishing pond. Tertiary treatment studies with activated carbon are also contemplated to determine the extent to which the secondary effluent will lend itself to tertiary treatment, as future Delaware River standards may require the equivalent of tertiary treatment.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Department of Commerce and Industry
State of Louisiana

TITLE OF PROJECT: Evaluation of Polymeric Materials for the Treatment and Recovery of Petrochemical Wastes.

PROJECT SITE: Baton Rouge, La.

DATE AWARDED: April 16, 1969

FEDERAL GRANT: $48,295

TOTAL EST. PROJ. COST: $68,992

PROJECT NUMBER: 12020 - DQC

PPBS NO. 1202

DESCRIPTION OF PROJECT:

Evaluation, of recently developed reverse osmosis membranes for application to in-plant chemical waste streams, under laboratory and field conditions. Various selected membranes and petrochemical in-plant waste streams will be examined in a high velocity test circuit to obtain engineering and economic data, to provide guidelines for the application of reverse osmosis to various selected in-plant waste streams to reduce net organic loads by recovering their product values.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior

Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
The Dow Chemical Company
1000 Main Street
Midland, Michigan 48640

PROJECT DIRECTOR: (Name and Address)
Frank Brower
Director, Hydrocarbons and Monomers Laboratory
1000 Main Street
Midland, Michigan 48640

TITLE OF PROJECT: Demonstration of the Recondition and Reuse of Organically Contaminated Brines from Chemical Process Industries

PROJECT SITE: Midland, Michigan

PROGRAM (PROJECT) NUMBER:
12020 EAS

DATE OFFERED: June 16, 1969

DATE ACCEPTED (AWARDED): June 30, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 6/30/69 Thru: 6/29/71	$ 1,300,408	$509,810

DESCRIPTION OF PROJECT:

Develop and demonstrate a chemical-adsorption process for wastewaters from a phenol manufacturing plant. The process will treat the wastewaters for the removal and recovery of phenol and acetate and the remaining brine wastewater will be utilized for caustic-chlorine production. The basic process involves the selective separation of organic constituents by activated carbon beds. Beds will be regenerated by chemical means.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section 6(b) of the Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
E. I. du Pont de Nemours and Company
Pigments Department
Wilmington, Delaware 19898

PROJECT DIRECTOR: (Name and Address)
Dr. Lloyd L. Falk
Senior Consultant
E. I. du Pont de Nemours and Company, Engineering Dept.
Wilmington, Delaware 19898

TITLE OF PROJECT: "Ocena Disposal of Industrial Wastes"

PROJECT SITE: Wilmington, Delaware

PROGRAM (PROJECT) NUMBER: 12020 EAW

DATE OFFERED: June 16, 1969

DATE ACCEPTED (AWARDED): June 24, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: July '69 Thru: April '70	$ 874,452	$ 150,116

DESCRIPTION OF PROJECT:

To evaluate the various technical and economic aspects of the dispersal of an acid-iron industrial waste at sea, over the continental shelf of the Atlantic off the coast of Delaware.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

GR/6/69

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
The Dow Chemical Company
Texas Division
Freeport, Texas

PROJECT DIRECTOR: (Name and Address)
Mr. W. F. McIlheny
Contract Research Dept.
The Dow Chemical Company
Freeport, Texas 77541

TITLE OF PROJECT: "Treatment of Waste Waters Resulting from the Production of Polyhydric Organic Compounds"

PROJECT SITE: Freeport, Texas

PROGRAM (PROJECT) NUMBER: 12020 EBQ

DATE OFFERED: May 23, 1969

DATE ACCEPTED (AWARDED): June 5, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 6/5/69 Thru: 6/4/71	$282,490	$197,740

DESCRIPTION OF PROJECT: To develop a method of treatment of wastes from polyhydric manufacturing processes. Several alternative treatment methods will be examined to determine their technical, engineering, and economic feasibility. The results will be used to develop a conceptual design of a waste treatment facility for the briny wastes resulting from this chemical industry. Processes to be evaluated are aerobic biological systems, solvent extraction, foam fractionation, dialysis, and adsorption. Studies will include laboratory, bench scale, and pilot plant scale testing.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a ______________, under Section 6(b) ______________, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: Armour Industrial Chemical Company
(Name and Address) Chicago, Illinois 60611

PROJECT DIRECTOR: E. F. Harp
(Name and Address) Director Engineering
8201 West 47th Street
McCook, Ill 60525

TITLE OF PROJECT: Armour Industrial Chemical Company Secondary Wastewater Treatment

PROJECT SITE: McCook, Illinois

PROGRAM (PROJECT) NUMBER: 12020 EFW

DATE OFFERED: August 26, 1969

DATE ACCEPTED (AWARDED): Oct. 6, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 4/25/69 Thru: 1/24/72	$503,000	$210,500

DESCRIPTION OF PROJECT:

The development and demonstration of a secondary treatment biological process to reduce the effluent, from a Fatty Acid Derivatives Chemical Plant, to less than 100 ppm of hexane soluble materials. Development work includes the evaluation of an existing pilot plant test unit, to be followed by a full scale (0.5MGD) demonstration at the Armour McCook, Illinois plant site. The treated effluent water quality improvement obtainable by use of a tertiary treatment process will also be explored on a pilot scale.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
State of Alabama
Geological Survey and Oil & Gas Board
University, Alabama

PROJECT DIRECTOR: (Name and Address)
Doyle B. Knowles
Hydraulic Engineer
University, Alabama

TITLE OF PROJECT: "Treatment and Disposal of Complex Chemical Wastes"

PROJECT SITE: Tuscaloosa, Alabama

PROGRAM (PROJECT) NUMBER: 12020 EGC

DATE OFFERED: Sept. 24, 1969

DATE ACCEPTED (AWARDED): Oct. 20, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 10/20/69 Thru: 4/19/72	$989,525	$314,525

DESCRIPTION OF PROJECT:

To develop and evaluate a surface or subsurface method for control of pollution from a complex chemical waste from a petrochemical complex, manufacturing alkyd resin and phenols. Also to develop methodology and/or testing techniques to permit projections of: (1) the fate of waste components, and (2) the waste assimulative capacity, of deep geological formations.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Farmers Chemical Association, Inc.
Box 87
Harrison, Tennessee

PROJECT DIRECTOR: (Name and Address)
Edward C. Bingham
Tech. Asst. to Gen. Mgr.
Farmers Chemical Association, Inc.
Harrison, Tennessee 37341

TITLE OF PROJECT: "Removal of Nitrogenous Compounds from a Fertilizer Plant Effluent Using Modified Operation of Conventional Waste Treatment Systems"

PROJECT SITE: Tyner, Tennessee

PROGRAM (PROJECT) NUMBER: 12020 EGM

DATE OFFERED: June 13, 1969

DATE ACCEPTED (AWARDED): June 27, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 6/69 Thru: 6/71	$220,300	$154,210

DESCRIPTION OF PROJECT: A full scale development and demonstration of the treatment of nitrogenous fertilizer effluents using stripping or oxidation pretreatment techniques, followed by bio-nitrification in a conventional trickling filter sewage treatment plant as modified for the purpose of providing optimized removal of nitrogenous materials in the waste.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

GR 5/69

INFORMATION SHEET --

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R&D Grant awarded under Sec. 6b, Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR Engineering-Science, Inc.
150 East Foothills Blvd.
Arcadia, California 91006

TITLE OF PROJECT: "Preliminary Investigation Requirements-Petrochemical & Refinery Waste Treatment Facilities"

PROJECT SITE: Austin, Texas
DATE AWARDED: June 30, 1969

FEDERAL CONTRACT:
TOTAL EST. PROJ. COST: $17,000

PROJECT NUMBER: 12020 EID
PPBS NO. 12020

DESCRIPTION OF PROJECT: This project is to compile, organize, and effectively present the many components which constitute a preliminary wastewater-treatability study. It will be formulated with the intent of serving as a valuable format and source of reference for personnel charged with conducting laboratory and pilot plant programs relative to wastewater treatability including identification of the gaps in the knowledge, and presentation of the descriptions in a form useful by the Water Resources Scientific Information Center. Particular emphasis will be placed on programs where petrochemical and refinery wastewaters are involved, although many aspects of the report will have a much broader applicability.

INQUIRIES: Contact the Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

WJL/4/69

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Contract *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE *:* Chemical & Allied Products
TITLE of PROJECT *:* An Inorganic Chemical Profile Study

PROJECT SITE *:* Pittsburgh, Pa.

GRANTEE or CONTRACTOR	***PROJECT DIRECTOR***
: Cyrus Wm. Rice Division NUS Corporation Pittsburgh, Pa. 15205	: J. K. Rice
PROGRAM NUMBER	***GRANT or CONTRACT NUMBER***
: 12020 EJI	: 14-12-592
TOTAL ESTIMATED COST	***PROJECT PERIOD***
: $55,327	***Months*** : 6 months
GRANT or CONTRACT AMOUNT	***From*** : June, 1969
$55,327 ***or*** 100 *%* *of eligible project costs.*	***To*** : January, 1970

DESCRIPTION of PROJECT *:*
An industrial waste profile of specific inorganic chemical industries.

Direct Inquires to: ***Industrial Pollution Control Branch, Rm. 824***
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDWKR 1/70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS II *awarded under Section* 5 *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : 2818
TITLE of PROJECT : "Concentration and Removal of Industrial Wastes by Dialysis"
PROJECT SITE : New Orleans, Louisiana

GRANTEE or CONTRACTOR	*PROJECT DIRECTOR*
: State of Louisiana Department of Commerce & Industry	: Bailey Chemical Company
PROGRAM NUMBER	*GRANT or CONTRACT NUMBER*
: 1202	: 12020 EMI
TOTAL ESTIMATED COST	*PROJECT PERIOD*
: $67,262.64	*Months :* 24
GRANT or CONTRACT AMOUNT	*From :* 3/70
$ 32,539 *or* 50 *%* *of eligible project costs.*	*To :* 3/72

DESCRIPTION of PROJECT :
The proposed research is:

a. To study the phenomenon of dialysis with a view toward developing a satisfactory theory of selective migration and generating an appropriate mathematical statement;

b. to compare the efficiency of various types of dialysis equipment with respect to selectivity and mobility of solute particles in various media and thereby to develop parameters by which dialyzer membrane and optimal operating conditions can be determined for a number of typical industrial waste streams;

c. to evaluate the economics of dialysis as a tool in removing pollutants from industrial wastes and concentrating them to the extent that recoverability becomes feasible;

d. to design dialysis equipment for continued research and for pilot plant scale studies looking toward industiral applications.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
LRDWKR 2 /70 *Washington, D.C. 20242*

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V GRANT *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Chemical and Allied Products
TITLE of PROJECT : Anaerobic-Aerobic Chemical Waste Treatment

PROJECT SITE : Bay City, Texas

GRANTEE or CONTRACTOR	***PROJECT DIRECTOR***
: Celanese Corporation of America 522 Fifth Avenue New York, N.Y. 10036	: Dr. R. S. Dicks
PROGRAM NUMBER	***GRANT or CONTRACT NUMBER***
: 1202	: 12020 EPH
TOTAL ESTIMATED COST	***PROJECT PERIOD***
: $600,000	***Months*** : 30
GRANT or CONTRACT AMOUNT	***From*** : 6/30/70
$395,340 *or* 65.9 % *of eligible project costs.*	***To*** : 12/31/72

DESCRIPTION of PROJECT :
The proposed project will study and demonstrate the economics and process parameters of a bio-oxidation disposal system for high strength organic wastes on a commercial scale and compare the economics to deep well disposal.

Additionally, the project will:

1) Investigate the anaerobic conversion of intractable organic compounds to aerobically bio-degradable species to reduce the COD and BOD to levels suitable for discharge to receiving waters or for reuse.
2) Study the nitrate removal characteristics of the anaerobic-aerobic systems.
3) Demonstrate the use of automatic on-stream total organic carbon analyzers as process controllers and/or monitors.
4) Investigate the effects of series and parallel operation, changing recycle rates and dilution on the process efficiency.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
LRDWK(R) 4/70 Washington, D.C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a ______________, under Section 6 ______________, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Mineral Pigments Corporation
Muirkirk, Maryland

PROJECT DIRECTOR: (Name and Address)
Dr. Harold E. Weisberg
Technical Director
Mineral Pigments Corp.
Muirkirk, MD

TITLE OF PROJECT: Ion-Exchange Effluent Treatment Unit (PET)

PROJECT SITE: Muirkirk, Maryland

PROGRAM (PROJECT) NUMBER: 12020 ERM

DATE OFFERED: October 3, 1969

DATE ACCEPTED (AWARDED): Oct. 30, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 10/30/69 Thru: 10/29/70	$ 226,422	$115,967

DESCRIPTION OF PROJECT:

To develop and demonstrate the use of an ion-exchange process for recovery of chromate from chromate waste waters containing high concentrations (> 1000 ppm) of chromate. The proposed process is one which is used for dilute chromate content cooling tower waters.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V, under Section 5, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Manufacturing Chemists Association, Inc.
1825 Connecticut Avenue, N. W.
Washington, D. C. 20009

PROJECT DIRECTOR: (Name and Address)
Edwin L. Barnhart
Hydroscience Inc.
316 Broad Ave.
Leonia, New Jersey 07650

TITLE OF PROJECT: "The Effects of Chlorination on Treated Organic Chemicals"

PROJECT SITE: Leonia, New Jersey 07650

PROGRAM (PROJECT) NUMBER: 12020 EXG

DATE OFFERED: February 16, 1970

DATE ACCEPTED (AWARDED):

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From:1 Jan 70 Thru:1 Jan 71	$ 60,000	$ 42,000

DESCRIPTION OF PROJECT:

To conduct a study to determine any adverse effects that might result from the chlorination of certain industrial chemicals either before or after biological treatment. Specifically to:

1. To determine the effect of selected organic chemicals and their degradation products on chlorine demand and disinfection efficiency.
2. To determine, for selected chemicals, in which cases it is possible to form chlorinated compounds during disinfection of the treated effluent.
3. To determine the physical properties and degradation rate of any chlorinated compounds found.
4. To determine the influence of persistent chlorinated compounds on the stream biota. Several levels of life forms will be considered.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V, under Section 6(b) Federal Water Pollution Control Act (Clean Water Restoration Act),

GRANTEE OR CONTRACTOR: (Name and Address)
Union Carbide Corporation
Research and Development Dept.
P. O. Box 8361
South Charleston, W. Va. 25303

PROJECT DIRECTOR: (Name and Address)
G. W. Kumke
(same as above)

TITLE OF PROJECT: Identification and Control of Petrochemical Pollutants Inhibiting Anaerobic Treatment Processes

PROJECT SITE: South Charleston, West Virginia

PROGRAM (PROJECT) NUMBER: 12020 FER

DATE OFFERED: January 13, 1970

DATE ACCEPTED (AWARDED):

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 18 Months Thru:	$67,050	46,936

DESCRIPTION OF PROJECT:

The objective of this project is to identify chemicals in the wastewater from a large petrochemical plant that are inhibitory to anaerobic treatment and to study applicable means to eliminate such inhibition. As an initial step, inhibitory chemicals will be identified by performing batch degradability studies in conjunction with analysis by the latest methods available at Union Carbide's Technical Center in South Charleston, W. Va. Materials of particular interest will be sulfates, α-β unsaturated carbonyl compounds, and ammonia. A second study will involve the use of a photosynthetic bacterial-algal culture to overcome sulfide problems (i.e. microbial inhibition and oxygen demand). Digestion studies in which a degradable substrate is spiked with various levels of inhibitory materials will bemade to indicate allowable levels. A final demonstration run in pilot facilties using typical wastewaters is planned to verify the findings of the laboratory study.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20240

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Chemical and Allied Products
TITLE of PROJECT : Geigy Chemical Waste Treatment Facility

PROJECT SITE : Cranston, Rhode Island

GRANTEE or CONTRACTOR : Geigy Chemical Corporation
PROJECT DIRECTOR : Robert F. Curran

PROGRAM NUMBER : 1202
GRANT or CONTRACT NUMBER : 12020 FOH

TOTAL ESTIMATED COST : $1,268,300

GRANT or CONTRACT AMOUNT
$ 393,600 *or* 31 % *of eligible project costs.*

PROJECT PERIOD
Months : 30 months
From : 24 March 1970
To : 24 September 1972

DESCRIPTION of PROJECT :

(1) Demonstration of the feasibility of a multi-stage (three or more) plastic media trickling filter process for wastewaters from multiple organic chemicals plant. (2) Develop and demonstrate technical feasibility of total process control by automated systems for the process. (3) Evaluate the performance of a specific design of plastic media. (4) Demonstrate the stage-wise acclimation of micro-organisms as a factor in attaining extra high loading per unit of trickling filter packing. (5) Evaluate the performance of an additional treatment operation for further effluent quality improvement.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
LRDWKR / Washington, D.C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V *awarded under Section* 5RG *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Chemicals and Allied Products

TITLE of PROJECT : A State-of-the-Art Survey of Water Pollution Resulting from Fertilizer Manufacturing Operations

PROJECT SITE : Richland, Washington

GRANTEE or CONTRACTOR

:Battelle-Northwest
P. O. Box 999
Richland, Washington

PROJECT DIRECTOR

: H. T. Fullam
Battelle-Northwest
P. O. Box 999
Richland, Washington

PROGRAM NUMBER

: 12020

GRANT or CONTRACT NUMBER

: 12020 FPD

TOTAL ESTIMATED COST

: $24,750

PROJECT PERIOD

Months : 12
From : 7/1/70
To : 6/30/71

GRANT or CONTRACT AMOUNT

$23,500 *or* 95 % *of eligible project costs.*

DESCRIPTION of PROJECT :

The proposed program is a study to evaluate water pollution problems of the fertilizer manufacturing industry. Problem areas in the various manufacturing operations will be defined, and the magnitude and types of water pollution identified. Current and planned industry efforts to control, reduce, and treat effluents which could interfere with quality standards will be evaluated.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
LRDW/KR 2/70 Washington, D.C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12020 FYE

TITLE OF PROJECT: Characteristics and Pollutional Problems of Pesticide Manufacturing Wastes

GRANTEE: University of Texas

PROJECT DIRECTOR: Dr. Patrick R. Atkins

Project Site: Austin, Texas

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 30, 1970	Project Cost:	$26,183
Completion Date:	June 30, 1971	Federal Cost:	$24,143

DESCRIPTION OF PROJECT

State of the art study and survey on practices and research needs pertaining to wastewater treatment and pollution control technology related to pesticide-herbicide manufacturing industry.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1 (3-70) GR 4/70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT ~~GRANT~~ CONTRACT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Contract *Federal Water Pollution Control Act (Clean Water Restoration Act).*

GRANTEE: Electro-Optical Systems, Inc.
300 North Halstead St.
Pasadena, California 91107

TITLE OF PROJECT: "Plasma Arc Processing of Spent Sulfite Liquors"

PROJECT SITE: Pasadena, California

DATE AWARDED: May 16, 1968

FEDERAL GRANT: $49,945.00

TOTAL EST. PROJ. COST: $49,945.00

PROJECT NUMBER: 14-12-162

PPBS NO. 1204

DESCRIPTION OF PROJECT: To determine the technical and economic feasibility of plasma arc treatment of sulfite waste liquors.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior

GRW 1/69

Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS I Grant *awarded under Section* 5R *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

INDUSTRIAL CODE: Paper and Allied Products

TITLE of PROJECT: "Color and Mineral Removal from Kraft Bleach Wastes"

GRANTEE or CONTRACTOR : Montana State University Bozeman, Montana 59715	***PROJECT DIRECTOR*** : Dr. Robert L. Sanks
PROGRAM NUMBER : 12040 D[illegible]D	***PROJECT SITE*** : Bozeman, Montana
TOTAL ESTIMATED COST : $39,180	***PROJECT PERIOD*** ***Months*** :
GRANT or CONTRACT AMOUNT $ 34,000	***From*** : June 1, 1970 ***To*** : May 31, 1971

DESCRIPTION of PROJECT:

The broad objective of this research project is to determine the economic potential of synthetic resins for the control of pollution from kraft bleach wastes in reuse systems.

More specifically, the objectives are: (1) to explore the use of synthetic resins for the removal of color and other refractory organic contaminants, (2) to optimize the operation of fixed resin beds for sorption and also for demineralization, (3) to seek economical regenerating methods and innocuous means of waste disposal, (4) to compare the relative effectiveness and economy of resins with carbon, and (5) to estimate the cost of wastewater renovation, reuse, and recycle using resins either alone or with other aids.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
LR[illegible]W[illegible]R 5/70 *Washington, D.C. 20242*

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class I Grant, under Section 5 (Research), of the Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address) University of Washington
Seattle, Washington 98105

PROJECT DIRECTOR: (Name and Address) Dr. Joseph L. McCarthy
Department of Chemical Engineering
University of Washington
Seattle, Washington 98105

TITLE OF PROJECT: "Studies of Low Molecular Weight Lignin Sulfonates"

PROJECT SITE: Seattle, Washington

PROGRAM (PROJECT) NUMBER: 12040 DEH

DATE OFFERED: SEP 26 1969

DATE ACCEPTED (AWARDED):

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: Sept. 1, 1969 Thru: Aug. 31, 1970	$33,043	$ 30,661

DESCRIPTION OF PROJECT:

Studies are being undertaken to isolate and characterize low molecular weight lignin sulfonates which are formed from the lignin in wood by action of sulfite pulping process. Improved separation methods by gel chromatography recently developed in this laboratory will be applied to obtain fractions of rather narrow molecular ranges, especially in the low molecular weight range.

Information gained should be of assistance in developing economic uses for the waste liquors from sulfite pulp mills which are giving rise to the hazard of pollution of water sources.

Future studies will be devoted to the following subjects:

1. Separation by get chromatography (Sephadex);
2. Chemical modification of the low molecular weight lignin sulfonate fractions such as acetylation and esterification and separation by chromatographical means;
3. Structural studies with special emphasis upon NMR and mass spectroscopy:
4. Molecular weight determinations by Vapor-Pressure osmometric means.

INQUIRIES: [illegible] Industrial Pollution Control Branch, DAST
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b) Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Institute of Paper Chemistry
Appleton, Wisconsin 54911

TITLE OF PROJECT: "Chemical and Physical Nature of Color Bodies in Kraft Mill Effluents Before and After Treatment"

PROJECT SITE: Appleton, Wisconsin

DATE AWARDED: DEC 31 1968

FEDERAL GRANT: $119,504.70

TOTAL EST. PROJ. COST: $170,721

PROJECT NUMBER: 12040DKD

PPBS NO. 1204

DESCRIPTION OF PROJECT:

Kraft pulping wastes which are discharged into streams may darken the color of the water, contribute to the biochemical oxygen demand and increase the solids content of the stream. New federal and state water standards will require removal of such materials from mill effluents. Lime precipitation in small scale operations has been shown to remove certain of the solid constituents and demonstration grants on lime treatments have been approved at three kraft mill sites.

The objective of the proposed project is to determine the chemical and physical nature of the color bodies in the effluents from these three kraft mills both before and after lime treatment. The investigation should lead to a better understanding of the results of the lime treatments, and may suggest means for more complete removal of color.

INQUIRIES: **Contact the** Industrial Pollution Control Branch - DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12040 DLQ - 2nd year

TITLE OF PROJECT: **Slime Growth Evaluation of Treated Pulp Mill Wastes**

GRANTEE:
Oregon State University
Department of Microbiology
Corvallis, Oregon 97331

PROJECT DIRECTOR:
A. W. Anderson
Department of Microbiology
Oregon State University
Corvallis, Oregon 97331

Project Site: Corvallis, Oregon

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 1, 1970	Project Cost:	$16,965
Completion Date:	May 31, 1970	Federal Cost:	$15,415

DESCRIPTION OF PROJECT

This is a continuation of a project initiated in 1969. The objective of this research is to evaluate the slime growth promoting potential of treated pulp mill wastes. Wastes treated by various means will be tested for their ability to support slime growth using various procedures. Additional studies will be carried out in an effort to define specific carbon and nitrogen sources in treated wastes which support the growth of Sphaerotilus. The effects of environmental factors on growth of Sphaerotilus also will be examined. This study will contribute to the development of abatement procedures for controlling slime growth as well as assist in establishing suitable water quality criteria for streams receiving pulp mill wastes. The study also will add to the knowledge on Sphaerotilus.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b) Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Continental Can Company, Inc.
Paperboard and Kraft Paper Division
Hodge, Louisiana 71247

TITLE OF PROJECT: "A Color Removal and Fibrous Sludge Disposal Process for the Kraft Paper Industry"

PROJECT SITE: Hodge, Louisiana

DATE AWARDED: JUL 25 1968

FEDERAL GRANT: $750,000.00

TOTAL EST. PROJ. COST: $2,865,970

PROJECT NUMBER: WPRD-240-01-68
12040 DRY

PPBS NO. 1204

DESCRIPTION OF PROJECT: The two year project will develop economical design and operational data applicable to the Kraft pulp and paper industry in removal of color in mill effluents, and disposing of fibrous sludges. Color removal will be accomplished by lime precipitation of the color bodies and fibers, with subsequent regeneration of the lime by sludge combustion in a kiln.

INQUIRIES: **Contact the** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted].
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b) Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: International Paper Company
220 East 42nd Street
New York, New York 10017

TITLE OF PROJECT: "Evaluation and Demonstration of the Massive Lime Process for the Removal of Color from Kraft Pulp Mill Wastes."

PROJECT SITE: Springhill, Louisana **DATE AWARDED:** JUN 14 1968

FEDERAL GRANT: $595,000 **TOTAL EST. PROJ. COST:** $850,000

PROJECT NUMBER: WPRD-135-01-(R-1)-68 **PPBS NO.** 1204
12040 DYD

DESCRIPTION OF PROJECT:

International Paper Company proposes to isolate wastes from the caustic extraction stage of a Kraft pulp bleaching line and the unbleached decker of the pulp mill, and to treat these wastes separately and combined for the removal of color and reduction of biochemical oxygen demand by the Massive Lime Process over a period of 27 months.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DBD
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

GRW/5-68

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class I Grant, under Section 5R of the Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address) Oregon State University
Corvallis, Oregon 97331

PROJECT DIRECTOR: (Name and Address) Mr. Fred J. Burgess
Head, Department of Civil Engineering
Oregon State University

TITLE OF PROJECT: "Pulp Mill Effluent Disposal"

PROJECT SITE: Corvallis and Newport, Oregon

PROGRAM (PROJECT) NUMBER: 12040 EBY

DATE OFFERED: May 27, 1969

DATE ACCEPTED (AWARDED): June 2, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From:6/1/69 Thru:5/31/70	$ 20,781	$ 19,237

DESCRIPTION OF PROJECT:

Research will be conducted on predicting the effects of Kraft mill waste disposal in the ocean on the marine environment. A remote sensing system and aerial photography will be utilized to estimate waste concentrations, water currents, diffusion coefficients, and vertical concentration profiles in an ocean outfall plume. Aerial photography will be taken with a multispectral camera system of the waste field. Boat sampling will be conducted at the same time to provide "ground truth" data. Data will be compiled and analyzed by a system of computer analysis which was developed for this purpose in 1968-69.

The investigation will include several Kraft mill outfalls along the Oregon coast. Results of bioassays and chemical analyses will be related to photographic imagery. Zones of water quality influence about existing outfalls and proposed outfalls will be estimated, and diffusion coefficients will be estimated.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Georgia-Kraft Co., Rome, Ga.

TITLE OF PROJECT: Treatment of Selected Internal Kraft Mill Wastes in Cooling Tower

PROJECT SITE: Macon, Georgia

DATE AWARDED: 8-7-67 (O&A)

FEDERAL GRANT: $287,000

TOTAL EST. PROJ. COST: $411,000

PROJECT NUMBER: WPRD 116-01-68
12040 EEK

PPBS NO. 1204

DESCRIPTION OF PROJECT:

This project will determine the ability of cooling towers to both permit heat dissipation and recycle of waste water back to the condensers as well as the treatment efficiency that may be provided by passage of waste waters through the tower. Condensates and decker filtrate will be handled by this facility. Organic load reduction will probably be gained by a combination of chemical oxidation, air stripping of volatile constituents and biochemical oxidation.

INQUIRIES: Contact the Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible] Indiana Ave. N.W.~~
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Pulp Manufacturers Research League, Appleton, Wisconsin

TITLE OF PROJECT: Development of Reverse Osmosis for In-Plant Treatment of Dilute Pulping Industry Wastes.

PROJECT SITE:	6 mills to be used	**DATE AWARDED:**	September 26, 1967
FEDERAL GRANT:	$483,371	**TOTAL EST. PROJ. COST:**	$690,530
PROJECT NUMBER:	WPRD 12-01-68 12040 EEL	**PPBS NO.**	1204

DESCRIPTION OF PROJECT:

The project will determine the ability of reverse osmosis technology to both produce a product water suitable for re-use in mill processes, and a concentrate available for by-product recovery or for treatment prior to discharge. Wastes to be handled, at separate mills, will include weak sulfite washings, weak Kraft washings, bleach wastes, condensates and semi-chemical wastes. The semi-trailer housed reverse osmosis equipment will be transported to separate mills for the experimental work. Presently projected mill sites are located in Wisconsin and Minnesota. Others are to be selected.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

8/68

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class I Grant, under Section 5 (Research), of the Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
University of Washington
Seattle, Washington 98105

PROJECT DIRECTOR: (Name and Address)
Dr. G. G. Allan
Associate Professor Fiber Science
College of Forest Resources

TITLE OF PROJECT: "Pollution Abatement by Fiber Modification"

PROJECT SITE: Seattle, Washington

PROGRAM (PROJECT) NUMBER: 12040 EFC

DATE OFFERED: May 28, 1969

DATE ACCEPTED (AWARDED): June 10, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From:June 69 Thru:May 70 Terminal	$41,603	$37,850

DESCRIPTION OF PROJECT:

The broad aims of this research are:

1. to determine what species, size and shape of molecule can be attached to lignocellulosic fibers using simple reactions compatible with the established processes for the manufacture of fibrous products;
2. to investigate the effect of the attachment of such molecules on the physical properties of fibers and fiber composites, and
3. to use this information to assess the feasibility of reducing water pollution due to pulp liquor discharge by reattaching these waste chemicals to paper and wood fibers.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section Six of the Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
St. Regis Paper Company
150 East 42nd Street
New York, New York 10017

PROJECT DIRECTOR: (Name and Address)
Mr. Roy L. Miller
Post Office Box 1591
Pensacola, Florida 32502

TITLE OF PROJECT: "The Production and Use of Activated Carbon for Water Renovation in Kraft Pulp and Paper Mills"

PROJECT SITE: Jacksonville and Pensacola, Florida; and West Nyack, New York

PROGRAM (PROJECT) NUMBER: 12040 EJU

DATE OFFERED: JUN 13 1969

DATE ACCEPTED (AWARDED): JUN 25 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 6-30-69 Thru: 6-30-72	$1,461,562	$878,472

DESCRIPTION OF PROJECT:

St. Regis Paper Company proposes a program for the development of an economical system for maximum water reuse in the kraft pulp and paper industry as a means of water pollution control and conservation. This program is based on two concepts. The first is an effluent treatment cycle using activated carbon and the second is on-site carbon production and activation from readily available raw materials with full integration into the kraft mill recovery and power systems to achieve the lowest net cost of activated carbon.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Crown Zellerbach Corp., Camas, Washington.

TITLE OF PROJECT: Economic Optimization of Secondary Treatment and Determination of Load to Control Biological Growths in a Stream.

PROJECT SITE: Lebanon, Oregon	**DATE AWARDED:** 12-5-67 (O&A)
FEDERAL GRANT: $503,739	**TOTAL EST. PROJ. COST:** $802,000
PROJECT NUMBER: WPRD 69-01-68 12040 ELW	**PPBS NO.** 1204

DESCRIPTION OF PROJECT:

This project will seek to determine the costs of mechanically aerated lagoon treatment of pulp mill and paper mill wastes by examining in detail the comparison of retention time, aerated logoon depth, basin configuration, recycle and parallel versus series operation of two lagoons. Information will also be obtained concerning treatment achieved by multiple lower hp surface aerators compared to two high hp units. Further, the project will, by use of test streams, seek to determine the degree of treatment needed to prevent slime growth in the receiving stream.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible] Indiana Ave. N.~~W.
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: The Mead Corporation
Chillicothe, Ohio

TITLE OF PROJECT: "Evaluation of Role of High Rate Trickling Filters and Aeration Devices Separately and in Combination for the Advanced Biological Treatment of Integrated Kraft Pulp and Paper Mill Effluents"

PROJECT SITE: Chillicothe, Ohio

DATE AWARDED: December, 1966

FEDERAL GRANT: $299,950 or 70% of project

TOTAL EST. PROJ. COST: $428,500

PROJECT NUMBER: WPRD 55-01-67
12040 EMY

PPBS NO. 1204

DESCRIPTION OF PROJECT: The pulp and paper industry needs to find an alternative treatment process which is less expensive and difficult-to-operate than the conventional activated sludge process. As a step in this direction, this project will involve the continuous operation of a pilot treatment plant containing plastic trickling filter, brush-aerated oxidation ditch, conventional aerated lagoon, deep aerated lagoons, and two clarifiers in combinations and evaluate possible efficiencies.

The specific research objectives are to: determine the effect of influent quality on biological treatment; evaluate potential of plastic trickling filters alone and in combination with brush-aerated oxidation ditch, conventional aerated lagoon and deep aerated lagoon; and to achieve higher-than-conventional BOD removals from kraft mill wastes.

INQUIRIES: ***Contact the*** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b) Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Interstate Paper Corporation
300 East 42nd Street
New York, New York 10017

TITLE OF PROJECT: "Chemical Coagulation Color Removal System for Kraft Mill Effluents"

PROJECT SITE: Riceboro, Georgia

DATE AWARDED: June 27, 1968

FEDERAL GRANT: $466,895

TOTAL EST. PROJ. COST: $741,160

PROJECT NUMBER: WPRD-183-01-68
12040 ENC

PPBS NO. 1204

DESCRIPTION OF PROJECT: This project proposes to develop, install, and demonstrate a new chemical coagulation process for removing color from kraft pulp and paper mill effluents. The process uses a stoichiometric lime addition to the untreated wastes, prior to primary sedimentation, which adsorbs the color bodies onto the lime floc and is settled with the sludge. This sludge is then removed to lagoons for drying and storage.

INQUIRIES: Contact the Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

GRW:5/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6(b) Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Crown Zellerbach Corporation
1 Bush Street
San Francisco, California 94119

TITLE OF PROJECT: "A Demonstration Plant Evaluation of Four Methods for Pulp and Paper Mill Sludge Utilization and Disposal"

PROJECT SITE: Camas, Washington

DATE AWARDED: April 3, 1968

FEDERAL GRANT: $350,000

TOTAL EST. PROJ. COST: $848,320

PROJECT NUMBER: WPRD 144-01-68
12040 ESV

PPBS NO. 1204

DESCRIPTION OF PROJECT:

This demonstration study is a full-scale investigation of four methods of utilization and disposal of primary sludge from a combined pulp and paper mill. The areas of investigation are: disposal by incineration, utilization as "hog-fuel" make-up in a conventional steam boiler at rates ranging between 5 and 50%, use as a dried mulching material for highway slope preparation and the evaluation of sludge as an agricultural soil conditioner.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

8/68

INFORMATION SHEET--

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Georgia-Kraft Co., Rome, Ga.

TITLE OF PROJECT: Treatment of Kraft Mill Effluent by Foam Separation

PROJECT SITE:	Rome, Ga.	**DATE AWARDED:**	8-4-67
FEDERAL GRANT:	$48,181	**TOTAL EST. PROJ. COST:**	$68,830
PROJECT NUMBER:	WPRD 117-01-68 12040 EUG	**PPBS NO.**	1204

DESCRIPTION OF PROJECT:

The project is directed toward an examination of the possible separation, in the foam phase, of a significant portion of the dissolved organics contained in primary treated Kraft Mill waste. Hopefully it may be discovered that a high percent of the pollutional load may be separated in a relatively small volume by these means. This may then provide a larger volume of 'bottoms' suitable for discharge and a smaller volume of 'tops', or collapsed foam, directed to complete treatment.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

8/68

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class I Grant, under Section 5 (Research) of the Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
University of Washington
Seattle, Washington 98105

PROJECT DIRECTOR: (Name and Address)
Dr. Joseph L. McCarthy
Department of Chemical Engineering

TITLE OF PROJECT:

"Steam Stripping of Kraft Pulp Mill Effluent Streams"

PROJECT SITE: Seattle, Washington

PROGRAM (PROJECT) NUMBER: 12040 EXQ

DATE OFFERED: SEP 26 1969

DATE ACCEPTED (AWARDED):

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 9/1/69 Thru: 8/31/70	$ 37,429	$ 35,046

DESCRIPTION OF PROJECT:

Three specific aims of the original research program were:

(1) to secure information concerning the nature and concentration of steam-volatile substances present in Kraft pulp mill black liquors and condensates from several process conditions and wood species;

(2) to conduct further laboratory experiments and SEKOR process design studies in order to evaluate alternate ways of operating the SEKOR process and optimize the process;

(3) to conduct laboratory and process design studies directed toward evaluating procedures of separating SEKOR "oils" on an industrial scale for market sales.

In addition to continuing research toward the above objectives, it is also planned to conduct research at the University in close collaboration with SEKOR-related studies being done by industry.

INQUIRIES: ~~Contact Project Coordinator~~ Industrial Pollution Control Branch, DAST
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: N. Carolina State University, Raleigh, N. C.

TITLE OF PROJECT: Filtration of Kraft Pulp Liquor through Chips

PROJECT SITE: Raleigh, N. C.	**DATE AWARDED:** 8-4-67 (O&A)
FEDERAL GRANT: $18,144	**TOTAL EST. PROJ. COST:** $25,920
PROJECT NUMBER: WPRD 115-01-68 12040 EZZ	**PPBS NO.** 1204

DESCRIPTION OF PROJECT:

The project is directed toward a determination of the decrease in pollutional load that may be gained by filtration of weak Kraft washings through wood chips just prior to their entry into the pulping process.

INQUIRIES: Contact the Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

INDUSTRIAL CODE: Paper and Allied Products

TITLE of PROJECT: "Treatment Plant for Flocculation and Microscreening of Whitewater"

GRANTEE or CONTRACTOR
: Esleeck Manufacturing Co. &
Strathmore Paper Co.
Turner Falls, Mass.

PROJECT DIRECTOR
: Mr. John S. Mudgett
Strathmore Paper Co.
West Springfield, Mass

PROGRAM NUMBER
: 12040 FDE

PROJECT SITE
: Turners Falls, Mass

TOTAL ESTIMATED COST
: $605,400

GRANT or CONTRACT AMOUNT
$252,345

PROJECT PERIOD
Months: 24 months
From : June 24, 1970
To : June 24, 1972

DESCRIPTION of PROJECT:

The objectives of this grant are to investigate the applicability of microscreening of paper mill wastes from two paper mills manufacturing business, technical and other papers made from either rag or chemical wood pulps to determine the removal of biochemical oxygen demand (BOD), suspended solids, color and turbidity. Tests will be run utilizing a coagulant or coagulant aid, such as a polyelectrolyte, for the further removal of turbidity from the mocroscreener effluent. Evaluations to determine the possibility of reclaiming fibers from the microscreener sludge will be done. Appropriate treatment processes, such as centrifugation or sedimentation may enable the mills to economically recover lost fibers.

Data will be obtained to determine design factors and estimates of the cost of construction and operation of such a facility. The cost of operation will be correlated with the retail market value of the product. Also the study will conduct tests on a ultra-filter supplied free of charge by the FWPCA.

Direct Inquires to: ***Industrial Pollution Control Branch, Rm. 824***
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDWKR 4/70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6 (b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

INDUSTRIAL CODE: Paper and Allied Products

TITLE of PROJECT: Sludge Disposal and Material Recovery System for Manfacturers of Coated and/or Filled Papers.

GRANTEE or CONTRACTOR
: S. D. Warren Co.
89 Cumberland Street
Westbrook, Maine 04092

PROJECT DIRECTOR
: Richard Labrecque
S. D. Warren Co.

PROGRAM NUMBER
: 12040 FES

PROJECT SITE
: Westbrook, Maine

TOTAL ESTIMATED COST
: 65,875

GRANT or CONTRACT AMOUNT
$45,058

PROJECT PERIOD
Months: 12 months
From : May 15, 1970
To : May 15, 1971

DESCRIPTION of PROJECT:

The objective of this 12 month project is to evaluate the effectiveness of a pyrolysis process for the recovery and subsequent reuse of pigment from the dewatered sludge of a paper mill primary waste treatment system.

The major project activities will include, the installation of a grit removal system, the production of 3 tons of recovered pigment in a pilot plant rotary kiln, quality analysis of the recovered pigments, a paper production run using the recovered pigment and an evaluation of the effectiveness of the total process.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
LRDWKR 4/70 *Washington, D.C. 20242*

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Paper and Allied Products
TITLE of PROJECT : "Steam Stripping and Rectification of Kraft Pulp Mill Condensates and Black Liquors"
PROJECT SITE : Longview, Washington

GRANTEE or CONTRACTOR
Weyerhaeuser Company
Longview, Washington 98632

PROJECT DIRECTOR
: John Van Vessen
Weyerhaeuser Company
Longview, Washington 98632

PROGRAM NUMBER
: 12040 FKS

GRANT or CONTRACT NUMBER
: 12040 FKS

TOTAL ESTIMATED COST
: $183,905

GRANT or CONTRACT AMOUNT
$ 128,733 *or* 70.0 %
of eligible project costs.

PROJECT PERIOD
Months : 24
From : April 1, 1970
To : March 31, 1972

DESCRIPTION of PROJECT :

A pilot plant stripping unit will be designed and built. This will be installed along with auxilliary equipment for rectification and storage. Runs will be made using Decanter underflow; Blow condensate; Evaporator condensate and Black liquor. The stripping bottoms water will be tested and then sewered. The overhead which forms two immiscible liquids when condensed, will be decanted, forming a crude turpentine product and a water soluble organic layer. This will be further rectified and processed to evaluate the worth of the products therein. The main objective is to determine on a large pilot plant scale (50 gal/min. stripping unit) the efficiency and effectiveness of a steam stripping-rectification unit in reducing the volatile organic chemicals in the Kraft process condensate streams this reduction is directly proportional to the biochemical oxygen demand reduction that can be achieved by this process. The mass transfer data provided by this stripping and rectification equipment, along with the economics of any by-products derived is necessary for further decisions regarding full scale units.

Direct Inquires to: ***Industrial Pollution Control Branch, Rm. 824***
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDWXR 1/70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant ***awarded under Section*** 6(b) ***of the Federal Water Pollution Control Act (PL 84-660), as amended.***

INDUSTRIAL CODE: Paper and Allied Products

TITLE of PROJECT: "Closure of Water Use Loop in NSSC Pulp and Paperboard Mill Utilizing R-O as a Unit Operation"

GRANTEE or CONTRACTOR

: Green Bay Packaging, Inc.
Post Office Box 1107
Green Bay, Wisconsin 54305

PROJECT DIRECTOR

: William R. Nelson
Director Corporate Development
Green Bay Packaging, Inc.

PROGRAM NUMBER

: 12040 FUB

PROJECT SITE

: Green Bay, Wisconsin

TOTAL ESTIMATED COST

: $1,582,400

PROJECT PERIOD

Months : 42
From : June 15, 1970
To : December 15, 1973

GRANT or CONTRACT AMOUNT

$ 757,033

DESCRIPTION of PROJECT:

The objective of this 42 month project is to demonstrate the full scale mill conditions resulting from maximum closure of a pulp and paperboard mill wastewater loop. The closed loop system will utilize a 720,000 gpd R-O unit as the treatment process and a fluidized bed incinerator as the disposal technique.

Direct Inquires to: ***Industrial Pollution Control Branch, Rm. 824***
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRWR 4/27

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: **Texas A&M Research Foundation**

TITLE OF PROJECT: **"Metal Ion-Catalyzed Oxidation of Phenols and Aromatic Amines"**

PROJECT SITE:	Texas A&M	*DATE AWARDED:*	October 14, 1968
FEDERAL GRANT:	$40,265	*TOTAL EST. PROJ. COST:*	$234,000
PROJECT NUMBER:	WP 01179-03 12050 DIT	*PPBS NO.*	1205

DESCRIPTION OF PROJECT: **A Study of the mechanism and feasibility of metal ion-catalyzed oxidation of phenols and aromatic amines by molecular oxygen in wastewater systems partially treated with potassium permanganate.**

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class I Grant, under Section 5 of the, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
University of Oklahoma Research Institute
1808 Newton Drive
Norman, Oklahoma 73069

PROJECT DIRECTOR: (Name and Address) Prof. George Reid

TITLE OF PROJECT: State-of-the-Art Evaluation on Petroleum and Coal Wastes

PROJECT SITE: Norman, Oklahoma

PROGRAM (PROJECT) NUMBER: 12050 DKF

DATE OFFERED:

DATE ACCEPTED (AWARDED): Jan. 8, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 10/15/68 Thru: 10/14/69	$17,897	$14,297

DESCRIPTION OF PROJECT:

The objective of this project is to develop a state of art report on the characteristics of oil and coal wastes. The study will include the procedures used by industry for aggrigating and handling these wastes and will determine the applicability and efficiencies of various treatment processes. Literature surveys, personal interviews and field studies will be used to define future research needs.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

ELD 1/69

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: American Oil Company
910 South Michigan Avenue
Chicago, Illinois

TITLE OF PROJECT: "Treatment of Refinery Effluent by a Unique Combination of Biological and Chemical Processes.

PROJECT SITE: Whiting, Indiana

DATE AWARDED: February 20, 1969

FEDERAL GRANT: $336,535

TOTAL EST. PROJ. COST: $1,737,775

PROJECT NUMBER: 12050 DML

PPBS NO. 1205

DESCRIPTION OF PROJECT:

A 30 MGD scale project to demonstrate the advantages of using chemical coagulation and air flotation following biological conditioning to provide refinery effluent of high quality. To establish what operating flexibilities exist in such combination processing and the costs associated therewith. To evaluate a number of unique design features, including a hitherto unproven process for disposal of oily sludges, a unique and low-cost method for preventing sludge deposition in an aerated lagoon, a novel application of rotary-drum skimmers and a comparative study of alternate design features for air flotation.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET - - -

RESEARCH & DEVELOPMENT CONTRACT

This sheet describes briefly an R & D Contract awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

CONTRACTOR: Engineering Science, Inc.
150 East Foothill Blvd.
Arcadia, California 19006

TITLE OF PROJECT: The Characteristics and Pollutional Problems Associated with Petrochemical Wastes

PROJECT SITE: Austin, Texas

DATE AWARDED: Sept. 25, 1968

FEDERAL CONTRACT: $11,190.00

TOTAL PROJ. COST: $11,190.00

PROJECT NUMBER: 14-12-461

12050 DMT

PPBS NO: 1205

BRANCH CHIEF: William J. Lacy

PROJECT OFFICER: George Rey

DESCRIPTION OF PROJECT: The general scope of the project as developed under the Plan of Operation shall include a detailed development of the following:

1. History and Projection of petrochemical industry;
2. Definition, magnitude, and pollutants associated with these waste treatment problems;
3. Evaluation of control, treatment and disposal practices;
4. Listing of the special legal problems involved with petrochemical waste management;
5. Economic feasibility of present and future control methods, reflecting down stream uses; and
6. Evaluation of research needs.

The objectives of this proposed project will be achieved through a well coordinated plan of operation. A complete literature review shall be conducted using the numerous volumes available in the Engineering, Chemistry, Biology, and personal libraries located on the University of Texas campus. Additional information shall be obtained from various governmental agencies and selected industries. Additional data derived from the unpublished Environmental Health Engineering Reports shall be utilized.

INQUIRIES: Contact the

Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted].
Washington, D.C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS II Grant *awarded under Section* 5 *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Petroleum and Coal Products
TITLE of PROJECT : Efficiency of Fibrous Bed Coalescers

PROJECT SITE : Chicago, Illinois

GRANTEE or CONTRACTOR : Illinois Institute of Technology Chicago, Illinois 60616	*PROJECT DIRECTOR* : Dr. W. M. Langdon Dr. D. T. Wasan
PROGRAM NUMBER : 12050 DRC (2nd year)	*GRANT or CONTRACT NUMBER* :
TOTAL ESTIMATED COST : $41,665	*PROJECT PERIOD* *Months* : 12
GRANT or CONTRACT AMOUNT $34,998.60 *or* 84.0 *%* *of eligible project costs.*	*From* : June 1, 1970 *To* : May 31, 1971

DESCRIPTION of PROJECT : This project will produce a design for a complete 50 gpm coalescer unit utilizing the mathematical model developed during the first year. This design will be used to construct and test a 150 ml/min demonstration unit which will be operated on an actual industrial waste stream. The program will consist of the preparation of general plans, specifications, explanations, costs estimates, and a discussion of the anticipated performance in recovering finely-divided, insoluble liquid pollutants from the selected industrial source. The design must not only be effective and economical but also capable of adaption to the many different types of pollutants and conditions that may arise. The waste source for the bread-board demonstration unit will be a steel plant hot mill effluent before (100 ppm oil in water) and after (10 ppm oil in water) treatment at the plant.

Direct Inquires to. *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
Washington, D.C. 20242

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LRDWKR 4/70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: American Petroleum Institute
Air and Water Conservation
1271 Avenue of the Americas
New York, New York 10020

TITLE OF PROJECT: "Improved Capabilities of Biological Systems to Assimilate Oil"

PROJECT SITE: New York, New York

DATE AWARDED: June 20, 1968

FEDERAL GRANT: $51,470

TOTAL EST. PROJ. COST: $84,990

PROJECT NUMBER: WPRD 243-01-68
12050 DSH

PPBS NO. 1205

DESCRIPTION OF PROJECT:

The project will consist of a study of laboratory scale activated sludge waste treatment systems which will be operated to determine their tolerance to various types and amounts of hydrocarbons, the nature of the interference of the hydrocarbons, the fate of the hydrocarbons in the system, and to study methods for improving pretreatment of the influent and of improving the operation of the systems.

The work will be performed by Hydroscience, Inc. under the direction of an API Task Force. The project period will be 1 year.

INQUIRIES: Contact the Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W~~.
Washington, D. C. 20242

ELD/5-68

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class I Grant, under Section 5 R of the, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
President & Fellows of Harvard College
Office of Research Contracts
1350 Massachusetts Avenue
Cambridge, Mass. 02138

PROJECT DIRECTOR: (Name and Address)
Dr. Lloyd A. Speilman
Pierce Hall - Room 124
Harvard University
Cambridge, Mass 02138

TITLE OF PROJECT: "Oil Dispersion Coalescence by Porous Solid Contact"

PROJECT SITE: Cambridge, Mass.

PROGRAM (PROJECT) NUMBER: 12050 DXR

DATE OFFERED: September 2, 1969

DATE ACCEPTED (AWARDED): Oct. 1, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: Sept. '69 Thru: Aug 31, '70	$ 16,157	$15,349

DESCRIPTION OF PROJECT: This project will be directed at clarifying the fundamental mechanisms underlying bed coalescense and the formulation of general design criteria through a mathematical description of pressure drop and coalescense performance. The formulation will be guided by the experimental determination of the extent of phase separation and pressure drop under controlled variation of inlet drop size, suspension chemistry, median grain size, bed depth, flow rate, and grain surface treatment. The results of this work should be of use in the design of separation processes for treating aqueous oil dispersions.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

8/69
ELD

INFORMATION SHEET -- --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: American Oil Company
910 S. Michigan Avenue
Chicago, Illinois 60680

TITLE OF PROJECT: Fluid-Bed Incineration of Petroleum Refinery Waste

PROJECT SITE: Mandan, North Dakota

DATE AWARDED: May, 1968

FEDERAL GRANT: $170,265

TOTAL EST. PROJ. COST: $354,530

PROJECT NUMBER: WPRD-215-01-68
12050 EKT

PPBS NO. 1205

DESCRIPTION OF PROJECT:

The project consists of: (1) the design and construction of a fluid-bed incineration system for treatment of refinery chemical and oil sludge wastes, and (2) the operation and evaluation of the system as a means of treating the refinery wastes.

Capacities up to 70 barrels per day, at full scale, are to be processed. The identity of operating problems and the limitations of the system are to be determined. The cost of treatment of the refinery waste by the proposed method will be developed for the system as optimized during the demonstration period.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

INDUSTRIAL CODE: Petroleum & Coal Products

TITLE of PROJECT: "Demonstration of Oily Waste Disposal by Soil Cultivation Process"

GRANTEE or CONTRACTOR
: Shell Oil Company
P. O. Box 100
Deer Park, Texas 77536

PROJECT DIRECTOR
: M. L. Renquist
P. O. Box 100
Deer Park, Texas 77536

PROGRAM NUMBER
: 12050 EZG

PROJECT SITE
: Deer Park, Texas

TOTAL ESTIMATED COST
: $100,000

GRANT or CONTRACT AMOUNT
$ 70,000

PROJECT PERIOD
Months : 22
From : March 18, 1970
To : January 18, 1972

DESCRIPTION of PROJECT:

The project will consist of a series of experiments on the treatment of oily sludges (crude tank bottoms, Bunker C, intermediate wax oils) by spreading and cultivation into soil under prevailing climatic conditions. Nine test plots will be operated at specific nutrient addition levels. The objectives will be to determine:

1. Decomposition rates of various types of oily waste sludges
2. Effectiveness of adding nutrient supplements
3. Major microbiological species active in the soil
4. The cost of the process for the disposal of oily waste
5. Depth of oil penetration into the soil

The demonstration phase will follow a six month pilot phase for optimization of waste loading rates and nutrient addition.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDWKR 1/70

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Archer Daniels Midland Company
4666 Faries Parkway
Decatur, Illinois 62525

PROJECT DIRECTOR: (Name and Address) R. S. White (as above)

TITLE OF PROJECT: "ADM Company Waste Water Treatment"

PROJECT SITE: Decatur, Illinois

PROGRAM (PROJECT) NUMBER: 12050 FDK

DATE OFFERED: February 18, 1970

DATE ACCEPTED (AWARDED):

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 12/70 Thru: 6/71	$245,254	$106,677

DESCRIPTION OF PROJECT:

A full scale (~0-5 MGD) development-demonstration project for emulsion breaking of the effluent wastewaters resulting from soybean processing for oil. The project will develop and install the required additional facilities to break tight emulsions currently being discharged to a municipal sewer system. The existing system contains an oil separator-skimmer, and 1 day retention lagoon. To be explored will be primarily a two stage chemical system, with other physical and biological alternatives also to be evaluated. Also to be demonstrated is an ion exchange system, for sodium removal and wash water recovery, as researched by the USDA.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: RAI Research Corporation
36-40 37th Street
Long Island City, New York 11101

TITLE OF PROJECT: Improvement of Treatment of Food Industry Waste

PROJECT SITE: Long Island City, N.Y. **DATE AWARDED:** Feb. 9, 1968

FEDERAL GRANT: $40,075/1 year **TOTAL EST. PROJ. COST:** $57,250

PROJECT NUMBER: WPRD 3-01-68 **PPBS NO.** 1206

PROJECT OFFICER: Allyn Richardson NERO

DESCRIPTION OF PROJECT:

To investigate on a laboratory scale electrochemical oxidation of milk whey as a method of waste treatment.

INQUIRIES: ***Contact the*** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5 Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: University of Washington
Professor Dale A. Carlson

TITLE OF PROJECT: Status and Research Needs for Potato Waste Waters

PROJECT SITE: Seattle, Washington	**DATE AWARDED:** June 1, 1968
FEDERAL GRANT: $18,364	**TOTAL EST. PROJ. COST:** $19,331
PROJECT NUMBER: WP-01486-01	**PPBS NO.** 1206

DESCRIPTION OF PROJECT: The objective of this project is to prepare an exhaustive state-of-the-art report on potato processing waste waters including identification of process and waste streams, effects of process modification, types of processes and corresponding waste water treatment processes, effects of waste streams on receiving waters and land areas, and recent research developments. The report will include a discussion of current major research needs.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
RN 8/68 *Federal Water Pollution Control Administration*
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Minute Maid Company
Orlando, Florida

TITLE OF PROJECT: "Removal of Organics and Nutrients from Citrus Processing Plant Wastes"

PROJECT SITE: Leesburg and Auburndale Florida
DATE AWARDED: December 1966

FEDERAL GRANT: $350,000
TOTAL EST. PROJ. COST: $550,000

PROJECT NUMBER: WPRD 38-01-67
PPBS NO. 1206

DESCRIPTION OF PROJECT:

In Florida, about 52 plants of the citrus industry discharge about 130 mgd of waste, having an organic concentration amounting to 318,000 lbs. of BOD daily, into streams and lakes of Florida. This project is a step towards solving this pollution problem.

The objective of this project is to demonstrate the design and operational factors for organic and nutrient removal of citrus process waste by the activated sludge process, by stabilization in oxidation ponds with and without induced aeration, and absorption of nutrients by plant life with subsequent drying of materials in citrus feed mill.

STATUS: Bids have been reviewed, selected, and contract awarded for construction of treatment facility at Auburndale. At Leesburg, the site is operational and worthwhile information being collected on mixed municipal and citrus processing wastes by the activated sludge system.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

4/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Beet Sugar Development Foundation
P.O. Box 538
Fort Collins, Colorado 80521

TITLE OF PROJECT: Anaerobic-Aerobic Sugar Beet Waste Treatment

PROJECT SITE: Tracy, California

DATE AWARDED: June 1, 1968

FEDERAL GRANT: $25,300 - 4th year

TOTAL EST. PROJ. COST: $243,450

PROJECT NUMBER: WPD 93-04-68

PPBS NO. 1206

DESCRIPTION OF PROJECT: The objective of this project is to demonstrate a solution to the pollution and odor problems encountered in beet sugar factory waste disposal. This will be accomplished by passing the wastes (mainly screened flume water) through system of anaerobic-facultative-aerobic lagoons set up in series. Some water from the aerobic lagoon will be recycled back to the surface of the anaerobic lagoon to eliminate odors.

INQUIRIES: ***Contact the*** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

RN 8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: National Canners Association
1133 20th Street, N.W.
Washington, D.C. 20036

TITLE OF PROJECT: "Integrated Treatment of Liquid Wastes from Food Canning Operations"

PROJECT SITE: San Jose, California **DATE AWARDED:** 2/14/68

FEDERAL GRANT: $33,330 **TOTAL EST. PROJ. COST:** $55,120

PROJECT NUMBER: WPRD 151-01-68 **PPBS NO.** 1206

DESCRIPTION OF PROJECT: The objectives of this proposal are as follows: (1) to determine the feasibility of employing a high rate trickling filter in the San Jose, California canning plant to treat strong organic wastes encountered in vegetable and fruit processing operations, which although low in volume (approx. 20% of total), contribute as much as 60% to the total BOD load. The filter will be 14 ft. in diameter and 21.5 ft. high, employing synthetic media and operating in a range between 100 and 200 gpm. It will be subjected to variations in flow, pH control and nutrient addition to determine its optimun working parameters. (2) To determine the effectiveness of using an air flotation process with and without addition of flocculants in removing suspended solids prior to secondary treatment. (3) To evaluate center discharge solids separation techniques and its effect on the total BOD content.

A study will also be made of the usage of edible acids as a bacteriostatic agent to prevent growth in recirculated flume water. Following the one year testing operation, it is proposed to select units to be incorporated in full scale plant operations for a further demonstration project. The reason for the low project cost is due to NCA already having on hand several pieces of equipment required to test these processes.

STATUS: Received worthwhile information on operation of units during last fall's processing operations. Will continue with evaluation of the various units this fall.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. NW~~
Washington, D. C. 20242

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INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a ______________, under Section 6(b) __________, Federal Water Pollution Control Act (Clean Water Restoration Act).

Grant Director: Mr. Sidney Boxer, Dairy Research & Development Corporation

GRANTEE OR CONTRACTOR: (Name and Address)
Dairy Research and Development Corporation
111 Broadway
New York, N. Y. 10006
Phone: 212-227-2726

PROJECT DIRECTOR: (Name and Address)
Mr. Edred W. Bowen
Dairymens League
1250 Broadway
New York City, N.Y.

TITLE OF PROJECT: "Elimination of Pollution by and Utilization of Protein Concentrates (Dried Whey) from Milk Residues of Cheese Making"

PROJECT SITE: Vernon, New York

PROGRAM (PROJECT) NUMBER: 12060 DEQ
WPRD 219-01-R1

DATE OFFERED: November 7, 1968

DATE ACCEPTED (AWARDED): December 19, 1968

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 12/19/68 Thru: 12/19/70	$2,499,038	$551,350

DESCRIPTION OF PROJECT: A development and full scale demonstration for a process for the conversion of dairy whey into saleable food products by evaporation and spray drying methods. The conversion of whey to a useable food product in lieu of its disposal as a waste product from cheese manufacturing is the pollution abatement method to be developed and demonstrated. Research will be conducted on the use of dried whey as a supplement to various food products.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington. D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Farmbest, Inc.
Denison, Iowa

TITLE OF PROJECT: Waste Treatment Facility, Farmbest, Inc., Denison, Iowa

PROJECT SITE: Denison, Iowa

DATE AWARDED: October 5, 1968

FEDERAL GRANT: $289,790

TOTAL EST. PROJ. COST: $755,587

PROJECT NUMBER: WPRD 241-01-68
12060 DFF

PPBS NO. 1206

DESCRIPTION OF PROJECT:

This is a 15 month project to demonstrate, over one full year of operation, the application of anaerobic lagoons and two-stage trickling filters for the treatment of strong wastes resulting from the slaughtering and processing of hogs. This plant kills about 5000 hogs daily and waste flows average about 0.85 mgd. Data will be collected on the strength of wastes and the efficiency of individual treatment units under various loadings and weather conditions so the results can be projected for new plants using any combinations of these treatment units.

INQUIRIES: *Contact the*

Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Corn Products Company
Corporate Engineering
P.O. Box 345
Argo, Illinois 60501

TITLE OF PROJECT: "Treatment of Wastes from the Wet-Milling Industry"

PROJECT SITE: Pekin, Illinois

DATE AWARDED: July 24, 1968

FEDERAL GRANT: $482,680

TOTAL EST. PROJ. COST: $2,656,400

PROJECT NUMBER: WPRD-221-01-(R-1)-68
12060 DPE

PPBS NO. 1206

DESCRIPTION OF PROJECT: The 3½ year project entails the design, construction, operation, and an economic and technical evaluation of a 1 mgd completely mixed aerobic system for treatment of corn refining wastes.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

8/68

INFORMATION SHEET--

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Swift and Company
R&D Center
1919 Swift Drive
Oak Brook, Illinois 60521

TITLE OF PROJECT: "Removal and Recovery of Fatty Materials from Edible Fat and Oil Refinery Effluents"

PROJECT SITE: Bradley, Illinois **DATE AWARDED:** JUL 1 0 1968

FEDERAL GRANT: $249,307 **TOTAL EST. PROJ. COST:** $389,970

PROJECT NUMBER: WPRD-185-01-(R-1)-68 **PPBS NO.** 1206
12060 DQV

DESCRIPTION OF PROJECT:

The 18 month study to be conducted at the Swift and Company Bradley Refinery plant will have as its main objectives to demonstrate the effectiveness and economics of employing air flotation for the removal and recovery of fatty material present in water eminating from processing operations.

In addition to an extensive study of flocculating agents, a complete characterization of processing waste streams is planned. Laboratory analysis will include BOD, COD, ether solubles and suspended solids determinations, etc.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

HGK:5/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: University of Oklahoma Research Institute
1808 Newton Drive
Norman, Oklahoma 73069

TITLE OF PROJECT: "Demonstration of a Full Scale Waste Treatment System for a Cannery"

PROJECT SITE: Stilwell, Oklahoma **DATE AWARDED:** JUL 2 5 1968

FEDERAL GRANT: $75,226 **TOTAL EST. PROJ. COST:** $117,807

PROJECT NUMBER: WPRD-230-01-(R-1) 68 **PPBS NO.** 1206
12060 DSB

DESCRIPTION OF PROJECT: The objectives of this 18 month study will be to conduct an economic and technical evaluation of a 1.5 mgd biological system employing a combination of both the minimal solids and extended aeration techniques to treat high strength, nutritionally unbalanced cannery wastes.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible] Indiana Ave. N.W.~~
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Beet Sugar Development Foundation
156 South College Avenue
P. O. Box 538
Fort Collins, Colorado 80521

TITLE OF PROJECT: "State-of-Art, Sugarbeet Processing Waste Treatment"

PROJECT SITE: Fort Collins, Colorado

DATE AWARDED: April 18, 1969

FEDERAL GRANT: $14,310

TOTAL EST. PROJ. COST: $15,900

PROJECT NUMBER: 12060 DSI

PPBS NO. 1206

DESCRIPTION OF PROJECT:

The objective of this 8 month project will be the development of a state-of-art document emcompasing current domestic and foreign waste treatment technology in the sugarbeet processing industry. The report will include recommendations on major research needs.

INQUIRIES: Contact the Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Crowley's Milk Company, Inc.
145 Conklin Avenue
Binghamton, N.Y. 13902

PROJECT DIRECTOR: (Name and Address)
Dr. Robert R. Zall
Director of Research & Production
Crowley's Milk Company, Inc.
145 Conklin Avenue
Binghamton, N. Y. 13902

TITLE OF PROJECT: "Development and Demonstration of an Ultrafiltration Plant for the Abatement of Pollution from Cottage Cheese Whey"

PROJECT SITE: Ph. 1 Binghamton, New York

PROGRAM (PROJECT) NUMBER: 12060 DXF

DATE OFFERED: August 8, 1969

DATE ACCEPTED (AWARDED): Sept. 3, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 7/1/69 Thru: 1/1/72	$914,081	$495,856

DESCRIPTION OF PROJECT:

A two stage Ultrafiltration system for the separation and concentration of protein and lactose or straight acid whey concentration with a resulting influent BOD reduction of 99% will be demonstrated. The first phase, lasting 13 months, calls for the design, detailed engineering, construction, operation and evaluation in Binghamton, N. Y. of a 10,000 lb/day UF system and will include the design of a 250,000 lb/day system for full scale demonstration under phase II. Duration of phase II will be 17 months.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Demonstration, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
National Canners Association
Research Foundation
1133 20th Street
Washington, D.C. 20036

PROJECT DIRECTOR: (Name and Address)
Jack W. Ralls
National Canners Association
1950 Sixth Street
Berkeley, California 94710

TITLE OF PROJECT: Reduction of Salt Content of Food Processing Liquid Waste Effluent.

PROJECT SITE: Berkeley, California

PROGRAM (PROJECT) NUMBER: 12060 DXL

DATE OFFERED: November 24, 1969

DATE ACCEPTED (AWARDED): Dec. 8, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 12/8/69 12 month Thru: 12/7/70	$94,208	$64,382

DESCRIPTION OF PROJECT:

The project will demonstrate the effectiveness of an ion exchange system for the treatment of olive brine waste water. The 10,000 gpd pilot unit will use calcium hydroxide as a resin regenerant and will be operated jointly by the National Canners Association and Aqua Ion Corporation. The operating parameters of the system will be established and scale up factors determined. It is anticipated that the degree of treatment will encourage the olive industry to consider water reuse and product recovery when full scale installations are considered.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
National Canners Association, Research Foundation
1133 20th Street, N.W.
Washington, D. C. 20036

PROJECT DIRECTOR: (Name and Address)
Mr. Walter Mercer, NCA Western Research Laboratory
1950 Sixth Street
Berkeley, California 94710

TITLE OF PROJECT: "Evaluation of Controlled Temperature and Forced Aeration in Trickling Filter Treatment of Food Canning Waste Waters"

PROJECT SITE: San Jose, California

PROGRAM (PROJECT) NUMBER: 12060 EAE

DATE OFFERED: May 15, 1969

DATE ACCEPTED (AWARDED): June 10, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: May 15, 1969 Thru: Nov. 15, 1969	$ 28,712	$ 18,350

DESCRIPTION OF PROJECT: The objectives of this project to be conducted at the DelMonte Corporation Plant No. 3 at San Jose, California are as follows:

1. To evaluate the performance and BOD reduction capacity on high strength liquid canning wastes of a 10,000 gpd trickling filter unit containing such special features as forced aeration and temperature control of the treatment column preceeded by grinding and screening components.
2. To compare the efficiency of this unit with that of the trickling filter without temperature control and forced aeration operated under WPRD 151-01-68, by subjecting them both to identical loadings eminating from the same waste source.
3. To incorporate the results of this evaluation into the design of a full scale demonstration project to be implemented in 1970. The six month project is an extension of work initiated under WPRD 251-01-68.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Department of Food Science and Technology
Oregon State University
Corvallis, Oregon 97331

TITLE OF PROJECT: "Water Pollution Abatement in the United States Seafoods Industry: State of the Art"

EFFECTIVE DATE: June 30, 1969

PROJECT SITE: Corvallis, Oregon	**DATE AWARDED:** April 15, 1969
FEDERAL GRANT: $17,695	**TOTAL EST. PROJ. COST:** $18,652.00
PROJECT NUMBER: 12060 ECF	**PPBS NO.** 1206

DESCRIPTION OF PROJECT: The objective of this 8 months study will be the development of a State of the Art document on water pollution abatement technology and research for the seafoods processing industry.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior

Washington, D. C. 20242

INFORMATION SHEET ⎯⎯

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: National Canners Association
1133-20th Street, N. W.
Washington, D.C. 20036

TITLE OF PROJECT: "Production and Disposal Practices for Liquid Wastes From Canning and Freezing Fruits and Vegetables"

PROJECT SITE: NCA, Berkeley, Calif.
U. of Wisconsin, Madison

DATE AWARDED: May 6, 1969

FEDERAL GRANT: $20,025

TOTAL EST. PROJ. COST: $22,542

PROJECT NUMBER: 12060 EDK

PPBS NO. 1206

DESCRIPTION OF PROJECT:

The objective of this one year project will be the development of a state-of-art document to encompass: (1) current and projected contribution of this industry to the national water pollution problem; (2) description of present and anticipated waste treatment technology to include construction and operational data (3) identification of areas requiring further development.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

HGK 4/7/69

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Demonstration Grant under Section 6B, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address) Green Giant Company
LeSueur, Minnesota 56058

PROJECT DIRECTOR: (Name and Address) Dr. E. E. Erickson
North Star Research & Development Inst.
3100 38th Avenue
Minneapolis, Minnesota 55406

TITLE OF PROJECT: Pilot Plant Installation for Use of Fungi Imperfecti on Vegetable Wastes

PROJECT SITE: North Star Research & Development Institute
Minneapolis, Minnesota

PROGRAM (PROJECT) NUMBER: 12060 EDZ

DATE OFFERED: September 1, 1969

DATE ACCEPTED (AWARDED): Sept. 23, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 7/1/69 Thru: 12/31/70	$72,860	$49,742

DESCRIPTION OF PROJECT: To demonstrate and evaluate on a pilot scale basis the use of fungi imperfecti as a biological agent in a aerated treatment system which treats high BOD vegetable processing wastes. According to bench scale tests the fungi are capable of removing organic nutrients with a related BOD reduction in excess of 98% with a 20 hour residence time. An aerated lagoon and aerated ditch will be employed to evaluate the fungi as a system component and the related operational and system characteristics will be defined.

.NQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class I Grant, under Section 5 Research, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Ohio State University Research Foundation
1314 Kinnear Rd.
Columbus, Ohio 43212

PROJECT DIRECTOR: (Name and Address)
Dr. W. James Harper
215 Vivian Hall
2121 Fyffe Road
Columbus, Ohio 43210

TITLE OF PROJECT: "State of the Art of Dairy Plant Wastes and Waste-Treatment Systems"

PROJECT SITE: Columbus, Ohio

PROGRAM (PROJECT) NUMBER: 12060 EGU

DATE OFFERED: June 17, 1969

DATE ACCEPTED (AWARDED): June 27, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 7/1/69 Thru: 6/30/70	$ 18,505	$ 12,954

DESCRIPTION OF PROJECT:

The objective of this one year project is the development of a State of the Art document for the dairy industry. Plant processing methods, water utilization, waste streams in various size and type of operations, dairy food plant waste treatment systems as a function of processing practice, plant size and location, current industrial development in dairy food processing and waste treatment, present research in progress and future research needs in relation to dairy wastes, will be covered.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Gold Kist Poultry Division
Cotton Producers Association
P. O. Box 2210
Atlanta, Georgia 30301

PROJECT DIRECTOR: (Name and Address)
Byron Hawkins
Gold Kist Poultry
910 Latta Street
Durham, N.C. 27704

TITLE OF PROJECT: "Water and Waste Management in Poultry Processing"

PROJECT SITE: Gold Kist Poultry
910 Latta Street
Durham, N.C.

PROGRAM (PROJECT) NUMBER: 12060 EGV

DATE OFFERED: June 12, 1969

DATE ACCEPTED (AWARDED): June 26, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 7/1/69 Thru: 6/30/71	$ 283,381	$198,366

DESCRIPTION OF PROJECT:

The University of North Carolina will conduct a two year study which involves changes in the Gold Kist processing operations for demonstration of effective in-plant control of both water use and discharge of effluent from poultry processing. The project encompasses water use and waste abatement throughout the plant, from water intake through final waste-water collection and control.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET--

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Melbourne Water Science Institute
Water Science Laboratories
15-21 Earl Street
Carlton, Victoria, Australia

TITLE OF PROJECT: "Cannery Waste Treatment by Lagoons"

PROJECT SITE: Shepparton, Victoria Australia

DATE AWARDED: May 1, 1969

FEDERAL GRANT: $11,920

TOTAL EST. PROJ. COST: $61,810

PROJECT NUMBER: WPD 211-02-68
12060 EHS

PPBS NO. 1206

DESCRIPTION OF PROJECT:

The objective of this study will be to demonstrate the feasibility of treating fruit and vegetable processing wastes by anaerobic lagoons and oxidation ditches.

The existing 100,000 gpd facilities at Shepparton will continue to be used during the final year of 2 year project to evaluate and optimize operational parameters of the anaerobic-aerobic system operating jointly or independently.

INQUIRIES: ***Contact the*** Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

HGK
3/69

INFORMATION SHEET--

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: North Star Research & Development Institute
3100 38th Avenue South
Minneapolis, Minnesota 55406

TITLE OF PROJECT: Use of Fungi Imperfecti in Waste Control

PROJECT SITE: Minneapolis, Minnesota

DATE AWARDED: Sept. 1, 1967

FEDERAL GRANT: $76,585

TOTAL EST. PROJ. COST: $118,585

PROJECT NUMBER: WPRD 49-01-68
12060 EHT

PPBS NO. 1206

DESCRIPTION OF PROJECT:

The objective of this 2 year project is to evaluate rapidly growing fungi strains for use in biological waste treatment processes applicable to waste streams from soybean and corn processing operations.

Synthesized mycelium will be evaluated for use as animal and/or human dietary supplement.

Parameters for industrial scale-up to accomodate a 1-3 mgd process operation will be determined based on results from a 50 gpd pilot plant operating on a continuous culture and flow basis.

INQUIRIES: **Contact the** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

HGK 8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: National Canners Association Research Foundation
1133 20th Street, N. W.
Washington, D. C. 20036

TITLE OF PROJECT: "Reconditioning and Reuse of Food Processing Brines"

PROJECT SITE: Central Valley, Calif. **DATE AWARDED:** February 1, 1968

FEDERAL GRANT: $31,500 **TOTAL EST. PROJ. COST:** $45,000

PROJECT NUMBER: WPRD-134-01-68 **PPBS NO.** 1206
12060 EHU

DESCRIPTION OF PROJECT: Briefly the proposal is to conduct a pilot scale study to determine the feasibility of re-using spent brines from storage and processing operations in olive packing by reconditioning the brine through a charcoal absorption and filtration column. The portable filter will be operated throughout the duration of the two year project at each of four locations in the California Central Valley area.

The supporting collection, reduction and analysis of data will be directed toward eliminating the present tie-in to municipal sewage system as well as lagoon systems used by olive processors and develop economic and effectiveness data for full scale development.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: The R. T. French Company
Shelley, Idaho

TITLE OF PROJECT: "Aerobic Secondary Treatment of Potato Processing Wastes with Mechancial Aeration"

PROJECT SITE: Shelley, Idaho **DATE AWARDED:** Aug. 1967

FEDERAL GRANT: $483,217 **TOTAL EST. PROJ. COST:** $690,310

PROJECT NUMBER: WPRD 15-01-R1-67 **PPBS NO.** 1206
12060 EHV

DESCRIPTION OF PROJECT: This project is designed to demonstrate the effectiveness of an aerobic secondary treatment plant for treating the total flow of potato processing wastes (1 MGD and 14,580 lb. BOD). The aerobic treatment will follow an existing primary treatment plant.

The secondary treatment plant will consist of three earthen aeration basins equipped with mechancial surface aerators, a mechancially cleaned secondary clarifier, an aerobic digester, and sludge disposal beds. In addition, a silt removal system will be constructed, consisting of screening facilities, a pumping station, and two earthen ponds to retain silt accumulations for one processing season.

The aeration system will be tested under three operating schemes: 1.) as an extended aeration system in which biological sludge is returned to the aeration basin and the excess, to the digester; 2.) as a flow-through aeration basin with sludge carryover into the effluent; and 3.) as an intermittent aeration system in which the clarified upper portion of the aeration basin contents is discharged directly to the river. During these operations, studies will be made on the effects of foaming ice, temperature, pH, and nutrients on the efficiency of the process.

STATUS: Contracts for long lead items such as the aeration equipment and clarifiers to be awarded within thirty days. Final design and specifications for construction of the treatment facility to be completed on or about May 1, 1968.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

4/68

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: Western Potato Service, Inc.
(Name and Address) P. O. Box 1391 Highway #2 West
Grand Forks, North Dakota 58201

PROJECT DIRECTOR: James L. Martin
(Name and Address) Potato Service, Inc.
P. O. Box 809
Presque Isle, Maine 04769

TITLE OF PROJECT: "Full Scale Demonstration and Evaluation of Potato Dry and Wet Caustic Peeling Processes"

PROJECT SITE: Presque Isle Maine (Wet)
Grand Forks, North Dakota (Dry)

PROGRAM (PROJECT) NUMBER: 12060 EIG

DATE OFFERED: July 1, 1969

DATE ACCEPTED (AWARDED): July 22, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 7/1/69 Thru: 1/1/71	$1,042,212	$396,574

DESCRIPTION OF PROJECT:

The objective of this grant will be to demonstrate at full scale the economics and pollution reduction characteristics of a potato "dry" caustic peeling system and use as a base for comparison data to be obtained from a similar facility employing the conventional "wet" caustic peeling operation.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This project is a Demonstration grant under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Kent Cheese Company
1931 North 15th Avenue
Melrose Park, Illinois 60160

PROJECT DIRECTOR: (Name and Address)
Allen E. Fehr
626 West South Street
Freeport, Illinois 61032

TITLE OF PROJECT: "Kent Cheese Company - Waste Treatment Facility"

PROJECT SITE: Kent, Illinois

PROGRAM (PROJECT) NUMBER: 12060 EKQ

DATE OFFERED: September 11, 1969

DATE ACCEPTED (AWARDED): Sept. 26, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 7/1/69 Thru: 11/1/70	$65,722.80	$46,006.00

DESCRIPTION OF PROJECT:

Demonstrate the effectiveness of aerated lagoons for the treatment of cheese whey process rinse water and permeate from a whey reverse osmosis unit. The treatment system will utilize two aerobic lagoons inseries with submerged mechanical aeration equipment producing an extended aeration process. Data will be collected to allow evaluation of the extented aeration process to cheese whey waste flows.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of th Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Demonstration, under Section 6B, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Illinois Packing Company
911 West 37th Place
Chicago, Illinois 60609

PROJECT DIRECTOR: (Name and Address)
Roy J. Ricci, Procedyne Corp.; 221 Somerset St.
New Brunswick, N.J. 08903

TITLE OF PROJECT: A Method of Manure Disposal for a Beef Packing Operation

PROJECT SITE: Illinois Packing Co.

PROGRAM (PROJECT) NUMBER: 12060 EOF

DATE OFFERED: Sept. 24, 1969

DATE ACCEPTED (AWARDED): Oct. 22, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 10/22/69 Thru: 6/21/71	$ 156,000	$ 93,400

DESCRIPTION OF PROJECT:

A twenty month project to demonstrate the feasibility of the incineration of cattle paunch and ground manure. The project objectives will include the following:

To segregate existing process waste streams for concentration of waste solids.
To develop physical parameters for process waste streams.
To design and construct a fluidized bed incineration unit.
To investigate and document the treatment system performance, the economics, optimal operating characteristics and the significance of the system in terms of application to other segments of the animal production industry.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: John Morrell & Company
Ottumwa, Iowa 52501

TITLE OF PROJECT: "Construction and Study of a Demonstration Plant Utilizing the Aerobic Channel Method for Treating Packinghouse Wastes"

PROJECT SITE: Ottumwa, Iowa

DATE AWARDED: December 1966

FEDERAL GRANT: $489,000

TOTAL EST. PROJ. COST: $815,000

PROJECT NUMBER: WPRD-54-01-67
12060 EUB

PPBS NO. 1206

DESCRIPTION OF PROJECT: Four oxidation channels will be constructed to handle an equivalent load of 20,000 lbs. of BOD/day from a packinghouse on a 7-day basis with estimated flow of 3.5 mgd. The objective is to find an efficient, effective, and economical method of treating raw packinghouse wastes so they can be discharged directly into streams.

Each channel will be 460 ft. X 60 ft. with a capacity of 150,000 cu. ft. Channels 1&2 will receive raw wastewater from existing primary treatment systems. The overflow will be directed into Channels 3&4 which will be operated intermittently as aerator and settling basins. Channel 4 will allow the sludge to be returned to Channels 1&2 or removed for harvesting. The solids removed will be centrifuged or evaporated and dried.

The most feasible way of handling solids will be determined. Tests will be conducted to determine if the dried solids can be used an an animal-food supplement.

The process will be designed to give variable rates of aeration and flow to obtain maximum bio-chemical oxygen demand and nitrogen removal. The flow will be sampled and analyzed for total nitrogen, chemical oxygen demand, suspended solids, total solids, and grease; weekly samples will be tested for total volatile solids, total fixed solids, phosphate, total bacterial content, and coliform count.

STATUS: Final design and specifications for the treatment facility have been completed. Expect to advertise for bids no latter than April 15,1968 and begin construction during May 1968.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

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INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Demonstration Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Widmer's Wine Cellars, Inc.
Naples, New York 14512

PROJECT DIRECTOR: (Name and Address)
Edwin Haynes
Widmer's Wine Cellars, Inc.
Naples, New York 14512

TITLE OF PROJECT: Winery Wastewater-Characterization and Treatment

PROJECT SITE: Naples, New York

PROGRAM (PROJECT) NUMBER: 12060 EUZ

DATE OFFERED: November 20, 1969

DATE ACCEPTED (AWARDED): Dec. 18, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 12/18/69 26 months Thru: 2/17/72	$284,000	$148,900

DESCRIPTION OF PROJECT:

This project includes design, construction and operation of an extended aeration waste treatment plant to treat the process wastewaters from a winery.

The activities of the project are to characterize the winery wasteflow; design, construct and operate an extended aeration waste treatment system; study and document the treatment system, optimize the system; and determine the effectiveness of nutrient addition to the operation of the system.

The facility will be designed for a 120,000 gpd flow.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. [illegible]

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: FMC Corporation

TITLE OF PROJECT: "Cannery Waste Treatment by the Kehr Activated Sludge Process"

PROJECT SITE: Santa Clara, California **DATE AWARDED:** December, 1966

FEDERAL GRANT: $29,300 **TOTAL EST. PROJ. COST:** $43,200

PROJECT NUMBER: WPRD 18-01-67
12060 EZP **PPBS NO.** 1206

DESCRIPTION OF PROJECT: The Kehr Process, in essence, involves a combining of activated sludge aeration of 10,000 to 15,000 mg/l mixed liquor solids with aerobic digestion in a single aeration tank. This provides high removals of BOD, solids, and nutrients; facility for periodic high strength wastes; a stabilized, drainable water sludge; and comparatively low physical plant costs.

The objectives are to:

1. Demonstrate the revised Kehr Process using liquid-solids separation by high-rate flotation-densification system of activated sludge solids.

2. Demonstrate effectiveness of the process for treating cannery wastes combined with domestic sewage having a BOD_5 of 1000 to 2000 mg/l.

3. Demonstrate performance of the process with densified return sludge solids of 4% to 8% on a dry weight basis, thus affecting plant economy by use of smaller tankage volume.

4. Determine processing requirements for application to a full-scale treatment plant.

INQUIRIES: **Contact the** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Winter Garden Citrus Products Cooperative
P. O. Box 399
Winter Garden, Florida

TITLE OF PROJECT: "Lime Treatment and Inplant Reuse of an Activated Sludge Plant Effluent in the Citrus Processing Industry

PROJECT SITE: Winter Garden, Florida **DATE AWARDED:** March 22, 1968

FEDERAL GRANT: $165,000 **TOTAL EST. PROJ. COST:** $397,300

PROJECT NUMBER: WPRD-161-DI-(R-2)-68 **PPBS NO.** 1206
12060 EZY

DESCRIPTION OF PROJECT: The objective of this proposal will be to develop operational parameters and conduct an economic evaluation on lime treatment of effluent from a 2 mgd. activated sludge system treating citrus wastes and in-plant reuse of the lime treatment effluent. This study will cover lime treatment, with the addition of coagulant aids, and dewatering of sludges by centrifugation for usage in cattle feed preparation. Determination will be made on this system's effective in further reducing BOD, COD, and nutrients found in the activated sludge effluent.

The proposed project intends to demonstrate the effectiveness of lime precipitation on effluent from a 2 mgd. activated sludge system treating citrus wastes. The activated sludge system consists of an aeration pond providing from 24 to 36 hours detention time with the overflow being directed into a final clarifier. Operation of the activated sludge system will afford pH control along with nutrient supplementation and sludge recirculation.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted].
Washington, D. C. 20242

4/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Snokist Growers (formerly Blue Ribbon-Big Y Growers)
Yakima, Washington

TITLE OF PROJECT: "Pollution Prevention by Aeration of Fruit Processing Wastes."

PROJECT SITE: Yakima, Washington **DATE AWARDED:** August 1967

FEDERAL GRANT: $347,669 **TOTAL EST. PROJ. COST:** $572,262

PROJECT NUMBER: WPRD 58-01-68 **PPBS NO.** 1206
12060 FAD

DESCRIPTION OF PROJECT: The cannery now discharges it fruit-processing wastes into the Yakima River. The objective of this project is to determine the most economical method of removing 90% of the BOD from an expected flow of 2.6 MGD with a BOD_5 loading of 20,000 lbs.

Aeration methods, including modifications to the activated sludge process, will be tested on a plant-size scale to determine their effectiveness in treating fruit processing wastes.

Existing and specially designed new facilities, including lagoons and clarifiers, will be used in prototype studies of the effects of varying amounts of aeration, waste loading, waste detention, sludge returns, and chemical on the BOD level.

During the 1967 canning season, the lagoon and clarifier will be operated as a completely mixed activated-sludge facility. The new lagoon, with added aerators will operated as an aeration lagoon with no sludge return, each under varied loadings. During the 1968 canning season the facilities will be operated as a modified contact stabilization facility.

Information on the modifications will be compared and the results will be applied to the activated sludge process for use by industry and government as method for the biological treatment offruit processing wastes.

STATUS: Aeration basin completed and operational. Contracts being awarded for balance of construction. Facility to be completely operational by September 1968.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Vahlsing, Inc.
Easton, Maine

TITLE OF PROJECT: "Treatment of Alkaline Wastes from Potato Processing"

PROJECT SITE: Easton, Maine

DATE AWARDED: December 1966

FEDERAL GRANT: $196,014

TOTAL EST. PROJ. COST: $280,020

PROJECT NUMBER: WPRD 56-01-67
12060 FAG

PPBS NO. 1206

DESCRIPTION OF PROJECT:

The objectives of this project are to demonstrate the feasibility of; treating potato processing waste using the activated sludge system ; combining potato processing waste with sugar beet refining waste; and the feasibility of three in-plant closed waste water systems in the sugar beet plant.

The project will provide extremely valuable data to both the potato processing and beet sugar industry. The aim is also to determine if a $30 million industrial complex, composed of potato and sugar beet processing and a residential community, can exist on a small stream, as is proposed, and have clean water.

STATUS: Expect to receive final design and specifications for construction of the 600 gpm pilot scale activated sludge system, and proceed with advertisement thereof April 1, 1968, construction to begin shortly after May 1, 1968.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Beet Sugar Development Foundation

TITLE OF PROJECT: "Concentration of Sugar Beet Wastes for Economic Treatment with Biological Systems"

PROJECT SITE: Fort Collins, Colorado

DATE AWARDED: December, 1966

FEDERAL GRANT: $102,000

TOTAL EST. PROJ. COST: $372,500

PROJECT NUMBER: WPRD 43-01-67
12060 FAK

PPBS NO. 1206

DESCRIPTION OF PROJECT: The project is one phase of research to find an economic chemical or biological system to treat high volumes of sugar beet factory waste. One or more successful processes are necessary to satisfy effluent standards in States where sugar beets are processed.

The objective of the project is to concentrate sugar-beet factory wastes by chemical precipitation and reuse of the decanted solution in a closed recirculation system. The excess water accumulated during the operation will be treated by anaerobic and/or aerobic processes to remove BOD prior to discharge. The bioactivity will be studied concurrently.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted].
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Agricultural Experiment Station
University of Puerto Rico
Rio Piedras, Puerto Rico

TITLE OF PROJECT: Disposal of Rum Distillery Wastes

PROJECT SITE: Rio Piedras, Puerto Rico **DATE AWARDED:** July 1, 1968

FEDERAL GRANT: $46,252 - 1st year **TOTAL EST. PROJ. COST:** $85,400

PROJECT NUMBER: WPD-226-01-68
12060 FDR **PPBS NO.** 1206

DESCRIPTION OF PROJECT: The objective of this project is to develop the best method for the disposal of rum distillery waste. The waste will be subjected to detailed analysis and then will undergo pilot treatment by means of anaerobic digestion, activated sludge, and lagooning. These processes will then be evaluated in terms of efficiency and economics.

INQUIRIES: ***Contact the*** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

RN 8/68

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class V Grant, under Section 6(b), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
Beefland International, Inc.
Council Bluffs, Iowa 51501

PROJECT DIRECTOR: (Name and Address)
Ray Burke, Vice President
Beefland International, Inc.
Council Bluffs, Iowa 51501
(712) 328-3941

TITLE OF PROJECT: "Elimination of Water Pollution by Packing House Animal Paunch and Blood"

PROJECT SITE: Council Bluffs, Iowa

PROGRAM (PROJECT) NUMBER: 12060 FDS

DATE OFFERED: Nov. 25, 1969

DATE ACCEPTED (AWARDED): Dec. 23, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: Nov. 10, 69 Thru: May 10, 71	$ 367,870	$ 161,398

DESCRIPTION OF PROJECT:

This 18 month project will demonstrate the economic and technical feasibility of completely segregating blood and paunch from slaughterhouse operations and converting these materials into animal feed ingredients. Two dehydrators will be installed at Beefland International, Inc. and utilized to process the material generated from anticipated cattle kills of 250 head per hour.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

INDUSTRIAL CODE: Food and Kindred Products

TITLE of PROJECT: Acid Emulsion Breaking-Activated Sludge for Bakery Waste

GRANTEE or CONTRACTOR
: Ebinger Baking Co.
2290 Bedford Ave.
Brooklyn, New York 11226

PROGRAM NUMBER
: 12060 FJK

TOTAL ESTIMATED COST
: $464,860

GRANT or CONTRACT AMOUNT
$ 129,729

PROJECT DIRECTOR
: Leon Beltzer
Ebinger Baking Co.
2290 Bedford Ave.
Brooklyn, New York 11226

PROJECT SITE
: Melville, New York

PROJECT PERIOD
Months : 22 months
From : June 9, 1970
To : April 30, 1972

DESCRIPTION of PROJECT:

A waste treatment system will be designed, constructed, operated and evaluated for a 80,000 gallon per day effluent from a sweet-goods bakery. Acid emulsion breaking will be used as a pretreatment step to destabilize the fats and oils in the waste, activated sludge will be used as the secondary treatment process and a multimedia filtration system will be used to render the effluent suitable for subsurface leeching.

Direct Inquires to: ***Industrial Pollution Control Branch, Rm. 824***
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDWKR 4 /70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Food and Kindred Products

TITLE of PROJECT : Activated Sludge - Bio Disc Treatment of Distillery Wastes

PROJECT SITE :

GRANTEE or CONTRACTOR : American Distilling Co. So. Front Street Pekin, Illinois 61554	***PROJECT DIRECTOR*** : Robert G. Paulette Stanley Consultants Muscatine, Iowa 52761
PROGRAM NUMBER : 12060 FLL	***GRANT or CONTRACT NUMBER*** :
TOTAL ESTIMATED COST : 1,078,000	***PROJECT PERIOD*** ***Months*** : 24 ***From*** : June 22, 1970 ***To*** : June 22, 1972
GRANT or CONTRACT AMOUNT *$* 384,588 *or* 38.25 *%* *of eligible project costs.*	

DESCRIPTION of PROJECT :

The objectives of this project are to evaluate on a plant scale basis, the performance of Bio Disc and activated sludge processes for treating distillery waste water. Investigations will involve comparative operating and capital costs of the two treatment processes, evaluation of treatment efficiency and the development of design parameters for industry wide waste treatment process selection and sizing.

Direct Inquires to: ***Industrial Pollution Control Branch, Rm. 824***
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDVKR 4/70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Demonstration Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : 1206
TITLE of PROJECT : "Evaluation of the Rotating Biological Surface System on Meat Packing Wastes"
PROJECT SITE : Dakota,City, Nebraska

GRANTEE or CONTRACTOR : Iowa Beef Packers, Inc. Dakota City, Nebraska 68731	***PROJECT DIRECTOR*** : Jimmie A. Chittenden Iowa Beef Packers, Inc. Dakota City, Nebraska 68731
PROGRAM NUMBER : 1206	***GRANT or CONTRACT NUMBER*** : 12060 FMF
TOTAL ESTIMATED COST : $559,230	***PROJECT PERIOD*** *Months* : 24 months
GRANT or CONTRACT AMOUNT $195,751 *or* 42 % *of eligible project costs.*	*From* : 15 May 1970 *To* : 15 May 1972

DESCRIPTION of PROJECT :

The two year project consists of building and evaluating a 3MGD anaerobic-aerobic system where the aerobic treatment will be achieved by the use of eight two stage rotating biological surface units with a total surface area of 500,000 sq. ft.

Design, operational and economic data, including the existing pretreatment operations, will be documented.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDWKR 6/70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS I Grant *awarded under Section* 5 *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Food and Kindred Products

TITLE of PROJECT : Dry Caustic Peeling of Tree Fruit to Reduce Liquid Waste Volume and Strength

PROJECT SITE : Berkeley, California

GRANTEE or CONTRACTOR
: National Canners Association
1950 Sixth Street
Berkeley, California 94710

PROJECT DIRECTOR
: Jack W. Ralls
Research Manager, NCA
1950 Sixth Street
Berkeley, California 94710

PROGRAM NUMBER
: 12060 FQE

GRANT or CONTRACT NUMBER
:

TOTAL ESTIMATED COST
: $19,539

GRANT or CONTRACT AMOUNT
$17,538 *or* 90% %
of eligible project costs.

PROJECT PERIOD
Months : 9 months
From : March 30, 1970
To : December 31, 1970

DESCRIPTION of PROJECT :

The National Canners Association in cooperation with the U.S. Department of Agriculture will install demonstration scale equipment in a fruit cannery. The basic project objectives are to demonstrate the feasibility of using the dry caustic peeling process in the processing of tree fruit. Operational data will be collected during the grant period which will allow the comparison of the yield and quality of the peeled fruit and the quantity and quality of the process wastes with the conventional peeling process.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDWQR 3/70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: The Johns-Hopkins University, Dr. Charles E. Renn
Department of Environmental Engineering Science
Baltimore, Maryland 21218

TITLE OF PROJECT: Management of Recycled Waste-Process Water Ponds

PROJECT SITE: Hampstead, Maryland

DATE AWARDED: December 1, 1967

FEDERAL GRANT: $39,627.00

TOTAL EST. PROJ. COST: $180,921

PROJECT NUMBER: WPD 117-03

PPBS NO. 1207

Grant Period: 12 months

DESCRIPTION OF PROJECT:

The purpose of this project is to develop detailed information on the operational techniques required to permit the utilization of a limited supply of treated domestic wastewaters for a variety of manufacturing processes. Requirements for control of biological processes in wastewaters impounded and recycled extensively within manufacturing processes and operations is being investigated.

The project is being conducted at the Black and Decker Manufacturing Companys' Hampstead, Md. plant. Operations in the plant involve stamping, pressing, punching, grinding, forging, assembly, and performance testing in a controlled environment requiring 2600 tons of refrigeration for air conditioning during the warm months. The water supply from wells is very limited. Domestic wastewaters are treated and routed to a nine acre impoundment for recirculation through the plant processes and operations. A "no-additional-cost" time extension has been requested to permit further evaluation through another summer season.

INQUIRIES: ***Contact the*** Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

ELD 3/69

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Johns-Manville Products Corporation
Manville, New Jersey

TITLE OF PROJECT: "Experimental Closed Water System to Eliminate Waste Water Discharge from Johns-Manville Plant No. 3".

PROJECT SITE: Defiance, Ohio

DATE AWARDED: September 1, 1967

FEDERAL GRANT: $82,350

TOTAL EST. PROJ. COST: $164,700

PROJECT NUMBER: WPRD 87-01-67
12080 EZF

PPBS NO. 1208

DESCRIPTION OF PROJECT:

This project is designed to demonstrate the effectiveness of a total process-water reuse system involving diatomite filtration to treat wastes from the production of glass fiber insulations and elements.

The objective of this project is to eliminate completely the discharge of phenolic waste water from the Johns-Manville Plant. The plant now discharges 30 to 50 gpm of waste water which eventually flows into the Maumee River. This river has been cited as one of the critically polluted rivers of the nation.

The waste water now contains glass fiber, caustic, and phenols. As a part of the project, all of the process waste water will be recirculated. The residual solids, consisting of glass fibers and phenolic binders, will be removed by screening and diatomite filtration. Caustic cleaning solutions will be segregated from the manufacturing process water, ponded, and treated as required for dumping or for return to plant process use.

PROGRESS TO MARCH 25, 1968: Approval to purchase certain long-lead items of equipment on low bids has been given with repayment subject to approval of the final plans and specifications. The final plans and specifications are complete except for the electrical wiring and should be submitted for approval within two weeks.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior

ELD:3/68

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Se tion 6 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 DWM

TITLE OF PROJECT: Demonstration of a New Process for the Treatment of Textile Dyeing and Finishing Waste

GRANTEE:	PROJECT DIRECTOR:
C. H. Masland & Sons Wakefield, Rhode Island	William M. Pearson Manager, Waste Treatment Research Fram Corporation Providence, Rhode Island 02916

Project Site: Wakefield, Rhode Island

SPECIFIC DATA ABOUT THIS AWARD

Award Date: April 15, 1969	Project Cost: $39,450
Completion Date: July 15, 1970	Federal Cost: $27,615

DESCRIPTION OF PROJECT

The applicant proposes to construct a pilot facility to treat the full flow (50,000 gpd) of process and primary treated sanitary wastes from their Wakefield, Rhode Island plant. The principle operations of the plant are wool and synthetic fiber dyeing and spinning of fibers into yarn. The Pilot Facility will employ a process developed by the Fram Corporation (patent pending) for the biological regeneration of an activated carbon absorption and filtration system.

The plan of operation provides for (a) effluent profile analysis (b) design, construction, operation, testing, and evaluation of the pilot facility (c) development of design criteria for a 1 to 1.5 mgd plant and (d) preparation of reports.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 ECS

TITLE OF PROJECT: Survey of the State of the Art of Textile Waste Treatment

GRANTEE:
Department of Textiles
School of IM & TS
Clemson University
Clemson, SC 29631

PROJECT DIRECTOR:
Dr. John J. Porter

Project Site: Clemson University

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 24, 1969

Project Cost: $31,675

Completion Date: June 30, 1970

Federal Cost: $30,007

DESCRIPTION OF PROJECT

The study will include characterization of the liquid wastes from the major manufacturing processes as to composition and quantity per unit of production, identify successful and unsuccessful treatment processes and disposal practices presently in use, and suggest alternatives for least satisfactory practices. The study will be directed towards identifying areas most in need of research and those areas where research effort is most likely to yield beneficial results.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

DEPARTMENT OF THE INTERIOR,

WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 ECU

TITLE OF PROJECT: Textile Based Water Pollution-Information Study

GRANTEE:
North Carolina State University
Raleigh, North Carolina 27607

PROJECT DIRECTOR:
Robert W. Work
Director of Research
School of Textiles
North Carolina State University
Raleigh, North Carolina 27607

Project Site: Raleigh, North Carolina

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 9, 1969

Project Cost: $12,638

Completion Date: June 14, 1970

Federal Cost: $10,410

DESCRIPTION OF PROJECT

Collection of, abstracting and indexing all available literature dealing with water pollution from textile based sources, and preparation and storage of this information into the Water Resources Scientific Information System. Correlate information between the Water Resources Scientific Information Center, USDI, the M.I.T. Textile Center and the Shirley Institute thesauri.

Address Inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 EGW

TITLE OF PROJECT: Treatment of Cotton Textile Waste by Enzymes and High Rate Trickling Filter System

GRANTEE:
Holliston Mills, Inc.
111 Lenox Street
Norwood, Mass. 02060

PROJECT DIRECTOR:
J. L. Young
Holliston Mills, Inc.
P.O. Box 478
Kingsport, Tenn. 37662

Project Site: New Canton, Tennessee 37662

SPECIFIC DATA ABOUT THIS AWARD

Award Date: 12/12/69

Project Cost: $285,372

Completion Date: 12/31/72

Federal Cost: $144,741

DESCRIPTION OF PROJECT

The industry concerned purchases cotton greige goods and produces high grade book bindings. The manufacturing processes which produce a waste flow are desizing, caustic extraction, bleaching, dyeing, and sizing. The applicant proposes to substitute an enzyme desizing chemical in the desizing process which will reduce the pH and BOD load of the waste stream. A treatment system employing a primary clarifier, high rate trickling filter with plastic media, and a secondary clarifier will be used to treat the waste flow. The sludge from the treatment system will then be subjected to an enzyme reaction which will render it amenable to further biological oxidation.

The effectiveness of the manufacturing process change, and the operating characteristics and efficiency of the trickling filter and sludge handling system will be evaluated.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR, WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 EOE

TITLE OF PROJECT: Water Pollution Reduction Through Recovery of Desizing Wastes

GRANTEE:
North Carolina State University
Department of Textile Chemistry
Raleigh, North Carolina 27607

PROJECT DIRECTOR:
Carl E. Bryan
Department of Textile Chemistry
North Carolina State University
Raleigh, North Carolina 27607

Project Site: Raleigh, North Carolina

SPECIFIC DATA ABOUT THIS AWARD

Award Date: Oct. 6, 1969

Project Cost: $39,688

Completion Date: Oct. 6, 1970

Federal Cost: $35,833

DESCRIPTION OF PROJECT

The objectives of this twelve month research project include the following: to investigate processes for the recovery of desizing wastes in solid or concentrated form suitable for disposal, and to investigate processes for the recovery of desizing wastes in a reusable form. The wastes studied will be those from fabrics sized with carboxymethylcellulose (CMC), polyvinyl alcohol (PVA), and starch. In addition, data will be collected concerning the biodegradablity of the synthetic sizes.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 EOX

TITLE OF PROJECT: A Study of the Photochemical Degradation of Commercial Dyes

GRANTEE:	PROJECT DIRECTOR:
Clemson University Department of Textiles Clemson, South Carolina	Dr. John J. Porter Department of Textiles Clemson University Clemson, South Carolina 29631

Project Site: Clemson University, Clemson, South Carolina

SPECIFIC DATA ABOUT THIS AWARD

Award Date: August 20, 1969	Project Cost: $34,040
Completion Date: August 20, 1970	Federal Cost: $31,539

DESCRIPTION OF PROJECT

The objectives of this 12 month research project are to define and characterize the products of decomposition resulting from ultraviolet radiation of selected commercial textile dyes. The characterization will include distinquishing between photochemical and hydrolytically produced decomposition products.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 EQO

TITLE OF PROJECT: Demonstration of a New Process for the Treatment of High Pollutant Concentration Textile and Finishing Wastes

GRANTEE:	PROJECT DIRECTOR:
Palisades Industries, Inc. 2 Columbia Street Peace Dale, Rhode Island 02883	Calvin P.C. Poon Department of Civil Engineering University of Rhode Island Kingston, Rhode Island

Project Site: Peace Dale, Rhode Island

SPECIFIC DATA ABOUT THIS AWARD

Award Date: Oct. 3, 1969	Project Cost: $143,750
Completion Date: Feb. 1, 1971	Federal Cost: $64,687

DESCRIPTION OF PROJECT

The project will demonstrate the effectiveness of a pilot scale treatment system which would adequately treat a 50,000 gpd waste flow from a textile dye mill. The system consists of an aerated equalization basin, a anaerobic activated carbon unit, a aerobic activated carbon unit and a activated sludge regeneration unit.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 ESG

TITLE OF PROJECT: Zinc Precipitation and Recovery Plant

GRANTEE:	PROJECT DIRECTOR:
American Enka Corporation Enka, North Carolina	David W. Rock American Enka Corporation Enka, North Carolina 28728

Project Site: Enka, North Carolina

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 24, 1968	Project Cost: $980,417
Completion Date: Sept. 1, 1970	Federal Cost: $282,700

DESCRIPTION OF PROJECT

The objective of this 20 month full scale demonstration project is to remove soluble zinc emitted from spin bath operations in the manufacture of viscose rayon. Major activities of the project will include the following:

> To direct waste streams containing significant amounts of zinc into the existing 200 gpm chemical precipitation and recovery system, to improve the quality of both zinc sludge produced in the recovery system and the final effluent to enable their reuse in the manufacturing process, to optimize the system, to utilize the technology developed in the design, construction and operation of a new zinc precipitation and recovery system.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 EUX

TITLE OF PROJECT: Reuse of Plant Effluent and Cooling Water Blowdown as Process Water

GRANTEE:
Fiber Industries, Inc.
Box 10038
Charlotte, North Carolina 28201

PROJECT DIRECTOR:
William J. Day
Davis & Floyd Engineers
P.O. Box 428
Greenwood, North Carolina 29646

Project Site: Shelby, North Carolina

SPECIFIC DATA ABOUT THIS AWARD

Award Date: April 18, 1968

Project Cost: $500,000

Completion Date: Feb. 1, 1970

Federal Cost: $350,000

DESCRIPTION OF PROJECT

An existing facility provides treatment for the combined sanitary and equalized chemical process waste.waters from a synthetic fiber manufacturing plant. Treatment facilities consist of extended activated sludge aeration basins, clarifier, polishing ponds, aerobic sludge digestion basin, and a sludge holding pond.

The project will evaluate the treatability of this waste in a plastic media trickling filter, the feasibility of algae removal from the polishing pond effluent by use of microscreen filters, the feasibility of BOD, COD, color, odor and taste reduction in the final effluent by use of powered carbon for the purpose of ultimate reuse of the effluent as process makeup water, and chromate reduction of cooling tower blowdown to permit biological treatment.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12090 FWD

TITLE OF PROJECT: A Study of Gamma Induced Oxidation of Textile Effluents

GRANTEE:
American Assoc. of Textile
Chemists & Colorists
P.O. Box 12215
Research Triangle Park, NC

PROJECT DIRECTOR:
T. A. Alspaugh
AATCC Committee RA-58
Cone Mills, 4th & Maple Street
Greensboro, NC 27405

Project Site: Oak Ridge, Tennessee

SPECIFIC DATA ABOUT THIS AWARD

Award Date: 5/13/70

Completion Date: 9/12/71

Project Cost: $50,000

Federal Cost: $47,500

DESCRIPTION OF PROJECT

During the project period, work will be initiated to further develop and optimize a high pressure-radiolytic oxidation system. The oxidation system is of laboratory scale size and has initially been involved in joint FWQA/ORNL (Oak Ridge National Laboratory) experiments. Textile mill wastes, such as dyes, special finishing compounds, and other refractory wastes will be subjected to the treatment system. Information from the pilot scale demonstration will be collected concerning optimum operating conditions, radiation dose, temperature, pressure, and the cost of treatment for various types and concentrations of waste.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS I Grant *awarded under Section* 5R *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Lumber and Wood Products
TITLE of PROJECT : Influence of Log Rafting on Water Quality

PROJECT SITE : Corvallis, Oregon

GRANTEE or CONTRACTOR : Oregon State University Corvallis, Oregon 97331	***PROJECT DIRECTOR*** : Dr. Frank Schaumburg
PROGRAM NUMBER : 12100 EBG	***GRANT or CONTRACT NUMBER*** :
TOTAL ESTIMATED COST : $21,740	***PROJECT PERIOD*** *Months* :
GRANT or CONTRACT AMOUNT $20,633 *or* 94.9 *%* *of eligible project costs.*	*From* : June 1, 1970 *To* : May 31, 1971

DESCRIPTION of PROJECT :

The project objective is to determine the extent of log raft storage at selected locations in the Pacific Northwest and using data from previous experiments, evaluate the potential contribution of log raft storage to water pollution in those areas.

Research efforts during the first two grant years have provided laboratory and field data which quantitate the pollution contributed by individual logs, log segments and small groups of logs in various water storage situations. These data must now be applied to the vast, but undetermined, quantity of logs in water storage in the Pacific Northwest, so that a reliable estimate of the magnitudes of this pollution source can be made. This information is needed by state pollution control authorities so that log handling and storage activities can be responsibly controlled.

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
LRDWXR 5/70 Washington, D.C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Klamath Plywood Corporation
P. O. Box 1239
Klamath Falls, Oregon 97601

TITLE OF PROJECT:

"Aerobic Secondary Treatment of Plywood Glue Wastes"

PROJECT SITE: Klamath Falls, Oregon

DATE AWARDED: APR 19 1968

FEDERAL GRANT: $42,028

TOTAL EST. PROJ. COST: $65,040

PROJECT NUMBER: WPRD 174-01-(R1)-68
12100 EZU

PPBS NO. 1210

DESCRIPTION OF PROJECT:

The project objectives of this grant are to design, construct, operate and evaluate an extended aeration, activated sludge lagoon treatment plant on urea-formaldehyde glue wastes in order to provide data for others to utilize in efforts to abate water pollution.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Lumber and Wood Products

TITLE of PROJECT : "Treatment of Wood Preserving Waste by Chemical and Biological Methods"

PROJECT SITE : Crosby, Mississippi

GRANTEE or CONTRACTOR
: Hood Industries
490 E. Woodrow Wilson
Jackson, Mississippi 39206

PROJECT DIRECTOR
: Lamar Russell
Reynolds, Smith and Hills
Post Office Box 4850
Jacksonville, Florida 32201

PROGRAM NUMBER
: 1210

GRANT or CONTRACT NUMBER
: 12100 FSI

TOTAL ESTIMATED COST
: $250,000

PROJECT PERIOD
Months : 24 months
From :
To :

GRANT or CONTRACT AMOUNT
$170,000 *or* 68 %
of eligible project costs.

DESCRIPTION of PROJECT :

The project objectives are to determine the design and operating parameters of chemical and physical sedimentation and skimming, and biological oxidation of water borne wastes from the wood preserving industry.

The plan of operation consists of design, construction and operation of treatment facilities for all of the waste water from the wood preserving plant of the Crosby Lumber Company, Crosby, Mississippi. The present waste water flow is approximately 200,000 gallons per day and comes from preservation of wood with creosote, pentachlorophenol, and heavy metals such as CCA (copper, chromium, and arsenic).

Direct Inquires to: Industrial Pollution Control Branch, Rm. 824
Federal Water Pollution Control Administration
Washington, D.C. 20242

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: A.C. Lawrence Leather Company, Division of Swift &
Company, 10-18 Sawyer Street
Peabody, Massachusetts

TITLE OF PROJECT: "Wastewater Treatment Pilot Plant Investigation, Mixed Chrome Tannery Wastewater"

PROJECT SITE: South Paris, Maine **DATE AWARDED:** 8/30/67

FEDERAL GRANT: $87,215 **TOTAL EST. PROJ. COST:** $124,593

PROJECT NUMBER: WPRD-133-01-68 **PPBS NO.** 1212

DESCRIPTION OF PROJECT: The objectives of the project are as follows:

1) To demonstrate on a pilot plant scale the primary and secondary treatment, by the activated sludge process, of mixed chrome tannery wastewaters and sanitary sewage.
2) To demonstrate the pre-treatment of the tannery wastewater by carbonation with flue-gas and up-flow sedimentation in order to remove excess calcium, chromium, and sulfides.
3) To demonstrate the benefits of mixing municipal sanitary sewage with tannery wastewaters to provide the biological nutrients lacking in tannery wastes.
4) To determine design criteria for a scale up to a full scale demonstration plant and to provide a basis for estimating the costs of construction and operation of a full scale plant.
5) To determine optimum methods of dewatering sludge, with primary emphasis on concentration by centrifugation, with aim being to dewater sufficiently to dispose of solids as sanitary land fill.

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DEB
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible] Indiana Ave. N.W~~.
Washington, D. C. 20242

GRW 10/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: University of Cincinnati
Professor J. David Eye

TITLE OF PROJECT: Treatment of Total Wastes from a Sole Leather Tannery

PROJECT SITE: Marlinton, West Virginia **DATE AWARDED:** May 1, 1968

FEDERAL GRANT: $29,325 - 2nd year **TOTAL EST. PROJ. COST:** $166,000

PROJECT NUMBER: WPD 185-02-68 **PPBS NO.** 1212

DESCRIPTION OF PROJECT: The basic objective of this project is the complete treatment of the total wastes stemming from a large sole leather tannery. During the first year the beamhouse waste fractions were effectively separated and pretreated. During the second year of this grant the pretreated beamhouse waste will be blended with spent tan liquor and then treated in a series of stratified anaerobic-aerobic lagoons.

INQUIRIES: Contact the Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

RN 6/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: University of Virginia
Department of Civil Engineering
Charlottesville, Virginia 22903

TITLE OF PROJECT: An Anaerobic-Aerobic Lagoons for Treating Vegetable Tannins

PROJECT SITE: Luray, Virginia

DATE AWARDED: January 18, 1969

FEDERAL GRANT: $17,801

TOTAL EST. PROJ. COST: $68,500

PROJECT NUMBER: 12120 DIK

PPBS NO. 1212

DESCRIPTION OF PROJECT: The objective of this project is to demonstrate that the wastes from the bating, soaking, tanning, and bleaching processes in a vegetable tannery can be effectively treated by means of an anaerobic-aerobic lagoon. The wastes are to be equalized and combined prior to entering the lagoon. The lagoon is to be operated under varying conditions of aeration and BOD loading in order to determine optimum design parameters.

INQUIRIES: **Contact the** Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

GRW
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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 5, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Rensselaer Polytechnic Institute
Research Division
Troy, New York 12181

TITLE OF PROJECT: "Removal of Syndets and Reclamation of Laundry Wastes"

PROJECT SITE: Troy, New York

DATE AWARDED: January 24, 1969

FEDERAL GRANT: $25,055

TOTAL EST. PROJ. COST: $53,090

PROJECT NUMBER: 12120 D0D

PPBS NO. 1212

DESCRIPTION OF PROJECT:

To optimize and evaluate the best process or combination of processes attainable for the treatment and recovery of laundromat wasterwaters. Two commercially available treatment systems for laundromat wastewaters are to be used in the optimization and evaluation project. The needs required to produce waste effluents suitable for discharge to New York State receiving waters, and the treatment requirements to produce reusable water for laundromats will be determined and demonstrated.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awaried under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: S. B. Foot Tanning Company
Red Wing, Minnesota

TITLE OF PROJECT: "Aerobic Biological Treatment, Sludge Dewatering and Disposal and Effluent Reuse for a Side Leather Tannery"

PROJECT SITE: Red Wing, Minnesota

DATE AWARDED: May 15, 1968

FEDERAL GRANT: $475,000

TOTAL EST. PROJ. COST: $2,046,268

PROJECT NUMBER: WPRD 232
12120 DSG

PPBS NO. 1212

DESCRIPTION OF PROJECT:

The four year project will provide a full scale demonstration and investigation of primary sedimentation, biological secondary treatment utilizing aerated lagoons, and primary and secondary sludge dewatering and disposal by means of pressure filtration and incineration. The system will treat the total waste flow of 2.1 MGD from the side leather tannery. In addition an evaluation will be conducted to determine the influence of final treatment plant effluent reuse on hide processing and quality of the finished product by reusing it in the "limepaddle" and "wash soak" tanning operations.

INQUIRIES: *Contact the* INDUSTRIAL POLLUTION CONTROL BRANCH, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: Caldwell Lace Leather Company

TITLE OF PROJECT: "Complete Treatment of Tannery Industrial Waste for Chrome Tanning, Alum Tanning, and Vegetable Tanning"

PROJECT SITE: Auburn, Kentucky	***DATE AWARDED:*** December, 1966
FEDERAL GRANT: $46,340	***TOTAL EST. PROJ. COST:*** $68,200
PROJECT NUMBER: WPRD 25-01-67 12120 EFM	***PPBS NO.*** 1212

DESCRIPTION OF PROJECT: No completely satisfactory method has been devised for treating tannery industrial waste. Since tanneries use large volumes of water, containing organic and inorganic matter, suitable treatment methods must be found.

The objectives of the project are to demonstrate the feasibility of completely treating tannery waste from the only plant in U.S. that tans all three types of leather tannages - Chrome, Vegetable and Alum - and to obtain basic data to design full-scale treatment plants usable for any tannery.

The basic plan is to develop methods to pre-treat the three present leather tannages, to combine their streams, and to completely treat tannery industrial waste. The high alkaline content of beam house waste will be neutralized with high acid made up of various tannages. The organic solids will be reduced in an anaerobic-aerobic lagoon.

INQUIRIES: ***Contact the*** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

GW 1/67

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

INDUSTRIAL CODE: Leather Tanning and Finishing

TITLE of PROJECT: "Removal and Recovery of Sulfide from Tannery Wastes"

GRANTEE or CONTRACTOR
: Blueside Real Estate, Inc.
800 N. Atlantic Ave.
Kansas City, Missouri 64116

PROJECT DIRECTOR
: Henry R. Hannon
800 N. Atlantic Ave.
Kansas City, Missouri 64116

PROGRAM NUMBER
: 12120 EPC

PROJECT SITE
: St. Joseph, Missouri

TOTAL ESTIMATED COST
: $388,900

GRANT or CONTRACT AMOUNT
$110,950

PROJECT PERIOD
Months : 24
From : April 13, 1970
To : April 13, 1972

DESCRIPTION of PROJECT:

The basic objectives of the project are to translate pilot plant results into the development and demonstration on a plant scale of a process for removing sulfide from the effluent of a chrome tannery and recovering the sulfide in a form reuseable in the tannery. The project will demonstrate the technical feasibility of the sulfide removal method and will determine the economics of the process on a full scale plant.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDWKR 2 /70

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec.5 , Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Research Foundation, American Water Works Association.

TITLE OF PROJECT: Disposal of Wastes from Water Treatment Plants.

PROJECT SITE: New York, N. Y.

DATE AWARDED: July 25, 1968

FEDERAL GRANT: $46,305

TOTAL EST. PROJ. COST: $53,250

PROJECT NUMBER: WP-1535-01-69
12120 ERC

PPBS NO. 1212

DESCRIPTION OF PROJECT:

Preparation of a "State of the Arts" report on current practices and costs of disposing of sludges generated by water treatment plants. The results of this 12 month project will be used to develop a program for research and development needs for these significant problems of solids addition to watercourses.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[illegible]
Washington, D. C. 20242

8/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS V Grant *awarded under Section* 6(b) *of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Chemical and Allied Products
TITLE of PROJECT : Treatment of Complex Cyanide Compounds for Reuse and Disposal
PROJECT SITE : Rochester, New York

GRANTEE or CONTRACTOR
: Berkey Film Processing
260 Lunenburg Street
Fitchburg, Massachusett
01420

PROJECT DIRECTOR
: Thomas N. Hendrickson
474 Thurston Road
Rochester, New York 14625

PROGRAM NUMBER
: 12120 ERF

GRANT or CONTRACT NUMBER
:

TOTAL ESTIMATED COST
: $163,576

PROJECT PERIOD
Months : 12
From : 1 Jan. 70
To : 1 Jan. 71

GRANT or CONTRACT AMOUNT
$ 114,415 *or* 70 %
of eligible project costs.

DESCRIPTION of PROJECT :

To research and develop methods for the treatment of ferrocyanide waters from film processing, for recovery and disposal. Recovery methods to be explored are: (1) ozonation, and electrolytic oxidation to Ferricyanide. Treatment for diposal include: (1) ozonation for destruction; (2) Precipitation of complex cyanides; and (3) chlorination.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
Washington, D.C. 20242

LRDWKR 4/70

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class I Grant , under Section 5 Research , Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: City of Gainesville, Florida
(Name and Address)

PROJECT DIRECTOR: **(Name and Address)**
Mr. John R. Kelly, Director
Public Utilities
P. O. Box 490
Gainesville, Florida 32601

TITLE OF PROJECT: "Develop uses in water and waste treatment of $MgCO_3$ recovered from lime soda softening sludges"

PROJECT SITE: Gainesville, Florida

PROGRAM (PROJECT) NUMBER: 12120 ESW

DATE OFFERED: 11/12/69

DATE ACCEPTED (AWARDED): 12/30/69

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 11/1/69 Thru: 10/31/70	$ 27,554	$ 16,890

DESCRIPTION OF PROJECT:

The principal investigator has a modified process for the recovery of MgO from brucite or dolomite to the separation and essentially quantitative recovery of the Mg(OH)2 present in lime-soda softening sludges as very pure (99.7%) $MgCO_3$. This new process has been successfully tested on a pilot plant scale at Dayton, Ohio, for the past year and plans are now being made for the full-scale recovery of $MgCO_3$ from the sludge produced by both of that city's softening plants.

Another improvement of the process makes it possible for each of the several cities and industrial plants softening hard surface waters containing clay turbidity to employ both lime recalcination and magnesium recovery. This will substantially reduce treatment costs and also substantially eliminate a major water pollution problem. Application of $MgCO_3$ as a coagulant to be studied include the following:

1. the removal of turbidity and organic color from soft surface waters.
2. from hard or alkaline surface or well waters.
3. flocculation or sewage and for many types of industrial wastes.
4. with synthetic organic anionic and cationic polymers in (1), (2) and (3) above.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12120 EUR

TITLE OF PROJECT: Information Resource for Water Pollution Control in the Water Utility Industry

GRANTEE:	PROJECT DIRECTOR:
American Water Works Assoc. Research Foundation 2 Park Avenue New York, N. Y. 10016	Harry Faber AWWA, Research Foundation 2 Park Avenue New York, N. Y. 10016

Project Site: New York, N.Y.

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 26, 1970	Project Cost: $42,720
Completion Date: June 30, 1971	Federal Cost: $24,990

DESCRIPTION OF PROJECT

The objective of this 12 month project is to establish a research and development oriented information resource for the water utility industry. The information center will provide efficient collection, synthesis, and dissemination of information pertaining to the development and demonstration of water pollution control technology within the water utility industry.

The available literature concerning the water pollution control technology of the water industry will be abstracted and indexed for the Water Resources Scientific Information Center.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12120 FYF

TITLE OF PROJECT: Fluidized-Bed Incineration of Selected Carbonaceous Industrial Wastes

GRANTEE:
Ohio Department of Natural Resources
Ohio Departments Building
Columbus, Ohio 43215

PROJECT DIRECTOR:
David Papier
Ohio Dept. of Natural Resources
Ohio Departments Building
Columbus, Ohio 43215

Project Site: Columbus, Ohio

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 25, 1970	Project Cost:	$140,818
Completion Date:	June 30, 1971	Federal Cost:	$ 98,573

DESCRIPTION OF PROJECT

The Ohio Department of Natural Resources with the assistance of the Battelle Memorial Institute of Columbus, Ohio, will undertake a 12 month project with the following objectives: (1) evaluate the characteristics of aqueous wastes from selected industries to determine their amenability to fluidized-bed incineration, (2) determine the conditions required for burning the selected wastes so that the carbonaceous constituents will be eliminated without the production of noxious gases or other air pollution problems, (3) assess the overall technical and economic feasibility of fluidized-bed incineration for each waste under consideration. The wastes to be studied will be from the paint, textile, rubber, and plastics industries.

The application and use of the fluidized-bed process to water pollution control provides an effective means of treating certain types of industrial wastes with the elimination of the discharge of pollutants into streams and sewers.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, (a2) *Federal Water Pollution Control Act(Clean Water Restoration Act).*

GRANTEE: Harriman Utility Board
P. O. Box 434
Harriman, Tennessee 37748

TITLE OF PROJECT: "Treatment of Combined Sewage and Neutral Sulfite Semichemical (NSSC) Pulp and Paper Mill Wastes by High-Rate Biological Filtration and Extended Aeration."

PROJECT SITE: Harriman, Tennessee

DATE AWARDED: Jan. 17, 1969

FEDERAL GRANT: $238,905

TOTAL EST. PROJ. COST: $322,540

PROJECT NUMBER: 12130 DBF

PPBS NO. 12130

DESCRIPTION OF PROJECT:

Project Objectives: To investigate the significant factors affecting the treatment of combined municipal sewage and NSSC pulp and paper mill wastes by high rate biological filtration and extended aeration, separately or in combination, and to establish design criteria, operating parameters and treatment efficiencies.

Grant Duration: two (2) years

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DAST
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

1/69

GRW

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, a(2) *Federal Water Pollution Control Act(Clean Water Restoration Act).*

GRANTEE: City of Grand Forks, North Dakota
P.O. Box 1518
Grand Forks, North Dakota

TITLE OF PROJECT: Controlled Treatment of Combined Potato Processing-Municipal Wastes by Anerobic Fermentation, Aerobic Stabilization Process

PROJECT SITE: Grand Forks, N.D. **DATE AWARDED:** JUL 17 1968

FEDERAL GRANT: $389,478 **TOTAL EST. PROJ. COST:** $796,904

PROJECT NUMBER: WPRD-206-01-R1 **PPBS NO.** 12130
12130 DJB

DESCRIPTION OF PROJECT: A full scale 4.5 mgd demonstration and evaluation of the joint treatment of municipal sewage in conjunction with potato processing wastes using several pretreatment methods prior to final treatment in existing stabilizations ponds. The pretreatment methods include anerobic and aerated treatment, in series, anerobic treatment alone, and aeration alone, under varying seasonal waste load conditions.

In addition to determining the most efficient operation of the pretreatment methods, their effects on the conventional stabilization ponds will be extensively determined.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

8/68

HGK.

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, a(2) Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE: City of Tualatin, Oregon

TITLE OF PROJECT: Tertiary Treatment of Combined Domestic/Industrial Wastes

PROJECT SITE: Tualatin, Oregon

DATE AWARDED: March 20, 1968

FEDERAL GRANT: $230,800

TOTAL EST. PROJ. COST: $323,600

PROJECT NUMBER: WPRD-27-01-67
12130 DLF

PPBS NO. 12130

DESCRIPTION OF PROJECT: A secondary and tertiary sewage treatment plant will be constructed for treatment of combined municipal and industrial wastes. The industrial waste is generated by the manufacture of dog food and will comprise 25% of the BOD load on the treatment plant. The plant will be operated and studied for a period of one year. The tertiary plant (consisting of flocculation, settling and filtration) will be operated with the addition of alum for phosphate removal during the critical 6 months of low stream flow. During the remainder of the year, the secondary effluent will receive plain filtration to maintain a very high quality effluent. The feasibility of alternate methods of chemical sludge disposal and the economics of tertiary treatment with phosphate removal will be studied.

FWPCA PROJECT OFFICER: Michael Kiado

INQUIRIES: ***Contact the*** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

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HGK

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Grant, under Section 6, (a 2), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)
The City of Macon
City Hall
Macon, Georgia 31201

PROJECT DIRECTOR: (Name and Address)
Emory C. Matthews
Executive Secretary
Board of Water Commissioners
780 Third Street - Macon, Georgia 31201

TITLE OF PROJECT: "Pilot study of Treatment of Combined Municipal and Industrial Wastes in Selected primary and biological secondary facilities for the Reduction of Waste Materials Discharged to Receiving Streams."

PROJECT SITE: Macon, Georgia

PROGRAM (PROJECT) NUMBER: 12130 DPD

DATE OFFERED: Feb. 3, 1969

DATE ACCEPTED (AWARDED): Feb. 19, 1969

Grant or Contract Period	Eligible Grant Period Costs	FWPCA Grant or Contract Amount
From: 2/19/69 Thru: 2/18/70	$ 171,845	$128,883.75

DESCRIPTION OF PROJECT:

Project Objectives: The objective of this study is to develop information relating to the joint treatment of municipal and industrial wastes. The industrial wastes will be selected wastes from both pulp and paper, and wood products companies. The study will be accomplished on a pilot plant basis.

Grant Duration: one year

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Delaware River Basin Commission
25 Scotch Road - P.O. Box 360
Trenton, New Jersey 08603

TITLE OF PROJECT: Deepwater - Pilot Plant - Engineering and Interceptor Feasibility Study

PROJECT SITE: Salem County, N. J.

DATE AWARDED: April 1, 1969

FEDERAL GRANT: $646,700

TOTAL EST. PROJ. COST: $995,650

PROJECT NUMBER: 12130 DRO

PPBS NO. 12130

DESCRIPTION OF PROJECT: A pilot plant and engineering study to develop a chemical-biological treatment process for joint industrial-municipal wastes, capable of attaining at least 88 to 93 percent removal of major pollutants. Design, operating and cost information is to be obtained for a 80 MGD regional treatment complex. To test and evaluate Advanced Waste Treatment processes for final effluent polishing. To develop suitable cost apportionment formulations for the treatment of various industrial wastes by a joint regional complex operated by an Interstate Agency. To develop and demonstrate the requirements for organizing, operating and administering a regional facility by an Interstate Agency.

INQUIRIES: Contact the Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
633 Indiana Ave. N.W.
Washington, D. C. 20242

INFORMATION SHEET -- --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, (a)(2) *Federal Water Pollution Control Act(Clean Water Restoration Act).*

GRANTEE: City Council
City of Stockton
Stockton, California

TITLE OF PROJECT: "Upstream Packing House Waste Treatment Demonstration, City of Stockton"

PROJECT SITE: Stockton, California

DATE AWARDED: Feb. 25, 1969

FEDERAL GRANT: $381,078

TOTAL EST. PROJ. COST: $1,085,970

PROJECT NUMBER: 12130 DRT

PPBS NO. 12130

DESCRIPTION OF PROJECT: A full scale (2 MGD) development and demonstration of upstream treatment of packinghouse waste by use of aerobic treatment in a combination use of high rate activated sludge and in-sewer treatment. The complex is anticipated to result in the reduction of BOD load to the municipal system of 80 percent and demonstrate the utility value of the conveying sewer line to further treat sewage and to reduce capitol expenditures over a typical activated sludge plant otherwise required. It is intended to consider the use of the Kehr process for partial upstream treatment during pilot studies.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

2/69

HGK

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, (a)(2) Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Village of Walton
Village Hall
21 North Street
Walton, N.Y. 13856

TITLE OF PROJECT: "Dynamic Process Development for Biological Treatment of Whey Bearing Wastes"

PROJECT SITE: Walton, New York
Hastings on the Hudson, N.Y.

DATE AWARDED: Feb. 18, 1969

FEDERAL GRANT: $52,730

TOTAL EST. PROJ. COST: $80,047

PROJECT NUMBER: 12130 DUJ

PPBS NO. 12130

DESCRIPTION OF PROJECT:

Efforts of this one year bench and pilot study will be concentrated in resolving problems associated with biological treatment of wastes from the manufacture of cheese and associated dairy products. Frequency response techniques will be employed in the development of activated sludge systems with stable culture separation characteristics. Odor control techniques will be evaluated in packed tower trickling filter studies. A selected process will be employed in an on site pilot plant.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior

Washington, D. C. 20242

2/69

HGK

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, a(2) Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: Green Bay Metropolitan Sewerage District
Green Bay, Wisconsin

TITLE OF PROJECT: "Combined Industrial and Municipal Waste Treatment"

PROJECT SITE: Green Bay, Wisconsin **DATE AWARDED:** December 1966

FEDERAL GRANT: $251,250 **TOTAL EST. PROJ. COST:** $335,000

PROJECT NUMBER: WPRD-60-01-67 **PPBS NO.** 12130
12130 EDX

DESCRIPTION OF PROJECT: The project will be a study, evaluation, and determination of the effectiveness, design, and operating parameters of four alternative biological treatment processes and modifications for treating combined municipal and industrial (primarily paper mill) waste waters. A pilot waste water treatment plant for each process will be operated in parallel. The effluent quality, operating parameters, design variables, and cost relationships for each process will be determined. Each pilot plant will have a 1 to 10 gpm capacity for combined waste waters. After selecting the most promising process, an existing 60 gpm pilot plant will be modified to suit the selected process and will be operated for a year to demonstrate its performance and to generate performance data. The final objective is to evaluate the design, performance, and use of the systems and to generalize the results for applicability to other locations.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~[illegible]~~
Washington, D. C. 20242

GW/10-68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, a(2) Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: CITY OF JACKSONVILLE, ARKANSAS

TITLE OF PROJECT: "Demonstration of a Facility for the Biological Treatment of Complex Chlorophenolic Wastes.

PROJECT SITE: Jacksonville, Arkansas **DATE AWARDED:** May 17, 1968

FEDERAL GRANT: $153,569 **TOTAL EST. PROJ. COST:** $243,313

PROJECT NUMBER: WPRD 246-01
12130 EGK
PPBS NO. 12130

DESCRIPTION OF PROJECT:

A full scale (2-4 MGD) demonstration and evaluation of the joint treatment of industrial herbicide and municipal wastes, by the use of a municipal biological system composed of: primary clarification, bio-filters, aerated and stabilization ponds. The herbicides are of the chloro and chloro-oxyacetic acid deriviatives of phenol. Investigations will be conducted to determine how the concentration of the phenolics in a receiving stream can be reduced to a level below the tests and odor threshold, also to investigate the biological factors related to the removal of the herbicides during treatment. Suitable methods are to be developed for the identification of the various herbicide compounds. The adequacy of nutrient values in the joint waste to allow complete bio-processing of chlorophenolics and related compounds will also be demostrated

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted].
Washington, D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12130 EJD

TITLE OF PROJECT: A Pretreatment Study on Combined Industrial-Municipal Waste Waters

GRANTEE:	PROJECT DIRECTOR:
City of Hagerstown, Maryland	David S. Kappe Kappe Associates, Inc. P. O. Box 1036 Rockville, Maryland 20850

Project Site: Hagerstown Sewage Treatment Plant, Hagerstown, Maryland

SPECIFIC DATA ABOUT THIS AWARD

Award Date: March 15, 1968	Project Cost: $427,853
Completion Date: Sept. 15, 1970	Federal Cost: $320,890

DESCRIPTION OF PROJECT

This project is to evaluate pretreatment techniques for textile dyeing wastes. The dye wastes are reduced sulfur compounds with a high immediate and ultimate oxygen demand that cannot be satisfied in an activated sludge system. The pretreatment technique is to provide initial oxidation by diffused aeration, chlorination, and the separate additions of sodium nitrate and potassium permanganate. Ammoniation will also be used. The project will be for two years and include a waste source investigation, detailed baseline analyses, construction of the pretreatment facilities and full scale paralleling of the treatment system, and evaluation of the pretreatment techniques.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6,a(2) Federal Water Pollution Control Act(Clean Water Restoration Act).

GRANTEE: City of South St. Paul, Minnesota

TITLE OF PROJECT: "Efficiency and Economy of Polymeric Sewage Clarification"

PROJECT SITE: South St. Paul, Minn. **DATE AWARDED:** June 15, 1967

FEDERAL GRANT: $450,000 **TOTAL EST. PROJ. COST:** $845,159

PROJECT NUMBER: WPRD 111-01-67
12130 EKK **PPBS NO.** 12130

DESCRIPTION OF PROJECT:

The Demonstration Project includes construction of (1) New Grit Chambers (4 units) two for industrial wastes, one for sanitary sewage and one for either industrial or sanitary wastes. These grit chambers will allow sewage to be treated individually or in combination of the two basic sewages in the treatment process following grit removal; (2) Mechanical flash mix-facilities, laboratory and utility building improvements and the necessary piping and other appurtenant construction. The City will also construct an interceptor sewer, sludge ejector and pumping station in conjunction with the demonstration project but is not a part of this demonstration grant request. The project objectives are to determine the increased purification attainable by treating industrial wastes (packing house), sanitary sewage, combined sanitary sewage, and stormwaters or combinations of such wastes with polyelectrolytes and floc "weighting agents."

INQUIRIES: *Contact the* Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

8/68

INFORMATION SHEET

RESEARCH, DEVELOPMENT, OR DEMONSTRATION PROJECT

This Project is a Class IV, under Section 6 a(2), Federal Water Pollution Control Act (Clean Water Restoration Act).

GRANTEE OR CONTRACTOR: (Name and Address)	Department of Administration State of Vermont Montpelier, Vermont 05602
PROJECT DIRECTOR: (Name and Address)	Mr. John M. Simmonds Department of Administration State of Vermont Montpelier, Vermont 05602
TITLE OF PROJECT:	"Vermont Cheese Industry Pollution Abatement"

PROJECT SITE: East Georgia and East Wallingford, Vermont

PROGRAM (PROJECT) NUMBER: 12130 ENF

DATE OFFERED: September 19, 1969

DATE ACCEPTED (AWARDED): January 16, 1970

Grant or Contract Period	Eligible Grant Period Costs	FWQA Grant or Contract Amount
From: Thru:	$2,040,900	$832,120

DESCRIPTION OF PROJECT:

A three year comprehensive program with an estimated total cost of $3,700,000 is planned for pollution abatement from the cheese industry, which contributes approximately 80 percent of the industrial BOD load in the State of Vermont. The program will demonstrate the feasibility of economically eliminating 95 percent of the total whey produced in the State by use of a central whey drying facility which will produce material suitable for human consumption. This facility, to be located in East Georgia, Vermont, will have a processing capacity of 375,000,000 pounds of fluid whey per year. A study of unit process operations of Chedder, Cottage, Bakers and Mozzarella plants will be conducted to increase solids recovery and minimize waste generation. Concentration of, and utilization of cottage cheese rinse waters is planned, as well as determination of most suitable forms of treatment for the residual wastes.

INQUIRIES: Contact Industrial Pollution Control
Office of Research and Development
Federal Water Pollution Control Administration
U. S. Department of the Interior

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INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, a (2) *Federal Water Pollution Control Act (Clean Water Restoration Act).*

GRANTEE: City of Erie
Erie, Pennsylvania

TITLE OF PROJECT: "Joint Treatment of Domestic Sewage and Pulp and Paper Mill Industrial Wastes."

PROJECT SITE: Erie, Pa.

DATE AWARDED: JUN 20 1968

FEDERAL GRANT: $88,230

TOTAL EST. PROJ. COST: $333,674

PROJECT NUMBER WPRD-223-01-68
12130 EOC

PPBS NO. 12130

DESCRIPTION OF PROJECT:

This project is a 20 GPM pilot plant study to determine the feasibility of combining the treatment of normal domestic sewage and the weak wastes from a neutral sulfite semichemical pulp and paper mill.

One of the primary parameters of study will be the possible uptake of sewage neutrients by the treatment with equal volumes of the neutrient deficient pulping wastes. Full economic and design factors will be developed.

INQUIRIES: *Contact the* Industrial Pollution Control Branch
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~*633 Indiana Ave. N.W.*~~
Washington, D. C. 20242

GW:5/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, a(2) **Federal Water Pollution Control Act(Clean Water Restoration Act).**

GRANTEE: City of Dallas, Oregon

TITLE OF PROJECT: Complete Aerobic Treatment of Combined Domestic and Industrial Wastes with Mechanical Aeration

PROJECT SITE: Dallas, Oregon **DATE AWARDED:** Dec. 12, 1967

FEDERAL GRANT: $325,104 **TOTAL EST. PROJ. COST:** $463,472

PROJECT NUMBER: WPRD-29-01-67
12130 EZR **PPBS NO.** 12130

DESCRIPTION OF PROJECT: Design and build a treatment plant to demonstrate the economics and efficiency of the completely aerobic treatment method when applied to the treatment of combined domestic and industrial wastes from a small municipality. The industrial waste is generated by fruit canning operations and by plywood glue manufacture and will comprise 75% of the BOD load on the treatment facility. The application of aerobic digestion, mechanical surface aeration, and earthen embankment construction will be demonstrated.

STATUS OF PROJECT: Work ongoing.

PROJECT DIRECTOR: Sidney S. Lasswell, CH_2M, Corvallis, Oregon.

INQUIRIES: **Contact the** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
~~633 Indiana Ave. N.W.~~
Washington, D. C. 20242

4/68

INFORMATION SHEET --

RESEARCH & DEVELOPMENT GRANT

This sheet describes briefly an R & D Grant awarded under Sec. 6, (a)(2) ***Federal Water Pollution Control Act(Clean Water Restoration Act).***

GRANTEE: Onondaga County, N.Y.

TITLE OF PROJECT: A Demonstration of Joint Municipal-Industrial Waste Treatment in the Onondaga Lake Watershed

PROJECT SITE: Onondaga County, N.Y. **DATE AWARDED:** 8 September, 1967

FEDERAL GRANT: $357,150 **TOTAL EST. PROJ. COST:** $507,700

PROJECT NUMBER: WPRD-66 **PPBS NO.** 12130
12130 FAE

DESCRIPTION OF PROJECT:

Onondaga Lake has been a receptor of domestic and industrial wastes to such an extent that it is now in an advanced stage of eutrophication. This project is part of a twenty million dollar program to restore Onondaga Lake.

The objectives of this project are: (1) to demonstrate county-industry cooperative wastewater management of municipal-industrial wastes based on an entire watershed, (2) to demonstrate feasibility of treatment of mixtures of industrial and domestic wastes, (3) to demonstrate the treatment of an industrial waste stream with the waste effluent from another industry, (4) to evaluate the effects of proposed management and treatment methods on the economics of the treatment processes and on the restoration of the lake.

INQUIRIES: ***Contact the*** Industrial Pollution Control Branch, DED
Office of Research and Development
Federal Water Pollution Control Administration
U.S. Department of the Interior
[redacted]
Washington, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 12130 FAY

TITLE OF PROJECT: Aerobic-Anaerobic Pretreatment of Citrus Wastes

GRANTEE:
City Commission
City Hall
Brooksville, Florida 33512

PROJECT DIRECTOR:
C. E. Manuel
City Engineer
617 Lamar Avenue
Brooksville, Florida 33512

Project Site: Brooksville, Florida

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 30, 1970

Project Cost: $132,581

Completion Date: March 1, 1972

Federal Cost: $88,161

DESCRIPTION OF PROJECT

During the 20 month grant period, the grantee will verify the design parameters for, and determine the feasibility of operating, an aerobic-anaerobic pretreatment system for a citrus fruit processing plant. The treatment facility will be located on city property and will be operated by the City. The pretreatment system consists of two aerobic basins with mechanical aerators and two anaerobic basins. These basins will be operated in sequences and combinations and under various biological conditions to determine the optimum system. The hydraulic capacity of the system is 144,000 gallons per day with effluent requirements of 250 mg/1 BOD, 100 mg/1 Suspended Solids, and a PH of 6.5-8.5.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

RESEARCH & DEVELOPMENT PROJECT

This sheet briefly describes a CLASS IV Grant *awarded under Section* 6(a)(2)*of the Federal Water Pollution Control Act (PL 84-660), as amended.*

STANDARD INDUSTRIAL CODE : Food and Kindred Products

TITLE of PROJECT : Pollution Abatement & By-Product Recovery in Shellfish and Fisheries Processing - Phase I

PROJECT SITE : Kodiak, Alaska

GRANTEE or CONTRACTOR
: City of Kodiak
Box 685
Kodiak, Alaska 99615

PROJECT DIRECTOR
: Lee Johnson
Food, Chemical Research Laboratories, Inc.
4900 Ninth Ave., N.W.
Seattle, Washington 98107

PROGRAM NUMBER
: 1213

GRANT or CONTRACT NUMBER
: 12130 FJQ

TOTAL ESTIMATED COST
: $101,800

PROJECT PERIOD
Months : 12
From : April 6, 1970
To : April 6, 1971

GRANT or CONTRACT AMOUNT
$49,952 *or* 57%
of eligible project costs.

DESCRIPTION of PROJECT :
This is a 12 month Research and Development project to evaluate the various parameters involved in demonstrating the feasibility of constructing and operating a by-product recovery system for shellfish and fishery processing plants. Objectives include:

(1) Engineering survey of industrial waste quantities,

(2) conduct pilot plant experiments on by-product operations, and

(3) prepare pre-construction summary report.

Direct Inquires to: *Industrial Pollution Control Branch, Rm. 824*
Federal Water Pollution Control Administration
LRDWⓀR / *Washington, D.C. 20242*

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13020DGX

TITLE OF PROJECT: "Role of Animal Wastes in Agricultural Land Runoff"

GRANTEE:
Water Resources Research
Institute
North Carolina State U.
Raleigh, N.C.

PROJECT DIRECTOR:
David Howells
Water Resources Research Institute
North Carolina State U.
Raleigh, N.C.

Project Site: North Carolina Piedmont and Raleigh, N.C.

SPECIFIC DATA ABOUT THIS AWARD

Award Date:		**Project Cost:**	$46,344
Completion Date:	Project completed	**Federal Cost:**	$41,941

DESCRIPTION OF PROJECT

The project will survey several well defined small watersheds that contain significant confined and unconfined animal growing. The survey will assess the water quality of the drainage from the watershed and correlate it with such factors as type of growing facilities, animal densities, feeds, waste disposal facilities and practices, topographic features, and soil factors in order to develope relationships for estimating the pollutional impact from animal growing watersheds in the Middle Atlantic and Southeastern United States.

Final report being prepared.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13020 DPB

TITLE OF PROJECT: "Agricultural Contributions to Nutrients in Water"

GRANTEE:	PROJECT DIRECTOR:
Cornell University Ithaca, New York 14850	Paul Zwerman Department of Agronomy and Soils Cornell University

Project Site: Ithaca, New York

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 1, 1969	Project Cost: $160,883
Completion Date: May 30, 1971	Federal Cost: $147,768

DESCRIPTION OF PROJECT

The objectives of the project are to (a) develop working approximations of parameters necessary for estimating the contributions of nitrogen and phosphorus from agricultural land under selected major land use systems, and (b) to permit identification of farming practices by means of which such contributions may be minimized.

Project Officer: George Bailey, Southeast Water Lab, Athens, Georgia

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13020 DTV, Rev.

TITLE OF PROJECT: "Quantification of Pollutants in Agricultural Runoff"

GRANTEE:	PROJECT DIRECTOR:
South Dakota State University Brookings, South Dakota 57006	James N. Dornbush Civil Engineering Department Brookings, South Dakota 57006

Project Site: Brookings, South Dakota

SPECIFIC DATA ABOUT THIS AWARD

Award Date: January 23, 1970
Project Cost: $58,330
Completion Date: January 1972
Federal Cost: $55,330

DESCRIPTION OF PROJECT

The objectives of this project are to: (1) quantify the pollutional constituents in agricultural surface runoff and express them as contributions per unit area or per unit runoff, (2) relate unit pollutant contributions to soil types, land uses and management practices, and climatological factors, and (3) relate the portion of pollution constituents associated with both dissolved and suspended solids.

Project Officer: H. Page Nicholson, Southeast Water Lab.
Athens, Georgia

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13020 DWH, Rev.

TITLE OF PROJECT: "Nutrient Inputs to Streams from Fertilizers"

GRANTEE:

Alabama Agricultural & Mech. College
Normal, Alabama 35762

PROJECT DIRECTOR:

Robert R. Bradford
Alabama Agricultural & Mech. College
Normal, Alabama 35762

Project Site: Normal, Alabama

SPECIFIC DATA ABOUT THIS AWARD

Award Date: July 1, 1969

Project Cost: $62,667

Completion Date: June 1971

Federal Cost: $59,532

DESCRIPTION OF PROJECT

While it is known that agriculture and its related practices probably contribute to water pollution or to a decrease in "water quality" the magnitude of this contribution and possible corrective measures, in most cases, have not been well defined.

This project aims to provide information with respect to nutrient inputs of nitrogen and phosphorus to intermittent streams which are derived from fertilizers applied to different row crops. Since water carried by intermittent streams feed into major waterways, data obtained may be used to derive figures for nutrient inputs from row crops over the entire watershed area.

Project Officer: George M. Bailey, Southeast Water Lab, Athens, Georgia.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR
WASHINGTON D. C. 20242

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(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6(b) *Federal Water Pollution Control Act, As Amended*

PROJECT NUMBER: 13030 DOA

TITLE OF PROJECT: "Grand Valley Salinity Control Demonstration Project"

GRANTEE:
Colorado State University
P.O. Box 786
Grand Junction, Colorado 81501

PROJECT DIRECTOR:
Gaylord V. Skorgerboe
Agricultural Engineering Department
Colorado State University
Fort Collins, Colorado 80521

Project Site: Grand Junction, Colorado

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	July 1, 1970	Project Cost:	$80,489
Completion Date:	January 31, 1972	Federal Cost:	$76,053

DESCRIPTION OF PROJECT

In three selected study areas, irrigation canals and other water conveyance channels were lined to control the major source of recharge to the near-surface aquifers; thereby minimizing the quantity of flow through mineral yielding geological formations and reducing the gradient which forces saline water into the Colorado River. Detailed field observations and measurements will be made to evaluate the effectiveness of lining in preventing seepage and the reduction in salinity to the Colorado River.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5 Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 13030 DRQ

TITLE OF PROJECT: "Monitoring Herbicide Residues in Irrigation Systems"

CONTRACTOR:
Bureau of Reclamation
Denver, Colorado

PROJECT DIRECTOR
Chief of Engineers
Bureau of Reclamation
Denver, Colorado

Project Site: Denver, Colorado and Columbia Basin, Washington

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	Sept. 19, 1969	Project Cost:	$60,000
Completion Date:	Sept., 1972	Federal Cost:	$60,000

DESCRIPTION OF PROJECT

The purpose of this cooperative study is to find out how much herbicide gets into irrigation water as a result of routine herbicide applications made on irrigation systems to control aquatic and ditch-bank weeds and to determine herbicide dissipation rate as the treated water move downstream. The quantity of herbicide found will be valuable information and especially useful in petitions prepared for registration of herbicides for this specific use.

Project Officer: Thomas Maloney, Pac. N.W. Lab, Corvallis, Oregon.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

WPCHQ-9200-2
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5
Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 13030 EII

TITLE OF PROJECT: "Prediction of Mineral Quality of Return Flow Water from Irrigated Land"

CONTRACTOR:
(Interagency Agreement)
Bureau of Reclamation
U.S. Dept. of the Interior
Washington, D.C.

PROJECT DIRECTOR
Chief Engineer
Bureau of Reclamation
Denver, Colorado

Project Site: Vernal, Utah

SPECIFIC DATA ABOUT THIS AWARD

Award Date:

Project Cost: $150,000

Completion Date: June 1971

Federal Cost: $150,000

DESCRIPTION OF PROJECT

The objective of this program is to verify an already developed and an available prediction model for a well defined irrigated area. If the model is successful, the study will be extended to other areas, each of which typifies a different combination of soil, climatic, geologic and hydrologic conditions found in broad areas of irrigable land throughout the Western States. In each study area the program will seek to (1) fully characterize the aforementioned conditions, (2) employ the data collected and the prediction models to determine the theoretical quality of return flows, (3) measure the actual quality of return flows, (4) compart the results of the prediction models with the measurements of actual quality, and (5) identify and correct any deficiencies in the prediction models evidenced by the comparative analyses. The intended ultimate product of the program is a set of verified techniques that can be used in almost all irrigable areas to predict the quality of return flows from new irrigation projects. It also is intended that these techniques will have use in determining the quality of return flows from existing irrigated areas.

Project Officer: James Vincent, FWQA Basins Office, Denver, Colorado.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5 Grant
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13030ELY

TITLE OF PROJECT: "Nutrient Removal From Agricultural Waste Waters"

GRANTEE:
State of California
Department of Water Resources
Sacramento, California

PROJECT DIRECTOR:
Louis A. Beck
Department of Water Resources
P.O. Box 2385
Fresno, California 93723

Project Site: Fresno, California (Firebaugh)

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	6-1-70	Project Cost:	$176,600
Completion Date:	6-1-71	Federal Cost:	$53,000

DESCRIPTION OF PROJECT

The objective of this project is to determine the practicability of using an algal production and harvesting treatment method to remove nutrients from agricultural drainage waters and to determine the design criteria and the costs of construction, operation and maintenance of such a method.

Several algal production units are being operated to determine the optimum physical parameter which will grow a maximum culture of algae. The effects of nutrient additions is being investigated. Pilot scale seperation facilities are being operated to determine the most practical method of algae harvesting. The pilot scale facilities are being operated to determine the seasonal effects.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

*This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended*

PROJECT NUMBER: 13030 EOB

TITLE OF PROJECT: "Effect of Water Management on Quality of Ground Water & Surface Recharge"

GRANTEE:	PROJECT DIRECTOR:
Center for Water Resources Research Desert Research Institute Reno, Nevada 89507	Alan E. Peckham Desert Research Institute 4624 Maryland Parkway, South Las Vegas, Nevada 89507

Project Site: Las Vegas Valley, Las Vegas Wash, Neveda

SPECIFIC DATA ABOUT THIS AWARD

Award Date: Jan. 27, 1970
Project Cost: $140,290

Completion Date: Dec. 1970
Federal Cost: $127,470

DESCRIPTION OF PROJECT

1) To identify the effects on water quality of current water and waste water management. 2) To develop a comprehensive set of alternative solutions to the water quality problems which now exist as a result of the discharge of poor quality ground water in Las Vegas Wash and elsewhere in the lower portions of the Las Vegas Valley. 3) To demonstrate which of the possible solutions can most effectively be implemented to correct the pollutional aspects of Las Vegas Valley ground water and aid in general environmental quality improvement. 4) To demonstrate how waste water can be managed in such a manner as to improve the quality of the water which discharges into Lake Mead. 5) To develop a model of the system utilizing information developed from the Bureau of Reclamation project 13030 EII.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6(b)
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13030 EZM

TITLE OF PROJECT: "Effects of Furrow, Sprinkler, and Subirrigation Methods on Potential Pollution of Groundwater by Nitrates and Other Solutes"

GRANTEE:
Texas A&M University
Agricultural Research & Extension Center
Route 3
Lubbock, Texas 79401

PROJECT DIRECTOR:
Dr. C. W. Wendt
Texas A&M University
Agricultural Research &
Extension Center
Route 3
Lubbock, Texas 79401

Project Site: Knox & Lubbock Counties, Texas

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 20, 1970

Project Cost: $469,305

Completion Date: May 30, 1973

Federal Cost: $300,773

DESCRIPTION OF PROJECT

This project will consist of a series of field and laboratory experiments and data interpretation to determine the effects of subirrigation, conventional irrigation methods and nitrogen fertilizers on underground water pollution.

Field and laboratory facilities in Knox and Lubbock Counties, Texas, will be used to compare current and new irrigation and fertilization methods to determine the following:

a. The contribution of current irrigation and fertilization practices to pollution of underground water.

b. The potential of using modified current irrigation and fertilization practices for immediate reduction of pollution.

c. The potential of using subirrigation for more efficient water application and new systems of fertilization for long range solutions to the pollution problem.

d. The economics of installation, operation, and maintenance of subirrigation systems as compared to conventional irrigation systems and economics of each fertilization practice.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13030 FDJ

TITLE OF PROJECT: "Quality of Irrigation Return Flow"

GRANTEE:
Utah State University
Logan, Utah 84321

PROJECT DIRECTOR:
Dr. Larry G. King
Utah State University
Logan, Utah 84321

Project Site: Logan, Utah; Vernal, Utah

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	Sept. 30, 1970	Project Cost:	$188,288
Completion Date:	Sept. 30, 1971	Federal Cost:	$164,164

DESCRIPTION OF PROJECT

The primary objective is to conduct research on the problems that affect the quality of irrigation return flow. This is to be accomplished initially by studies in four areas or sub-projects:
(1) Precipitation mechanisms in soils as they affect water quality. This phase will be concerned with the changes in the quality of water, as it moves through soils, as a result of precipitation of calcium carbonate. (Detailed proposal is attached. This detail can be prepared for the other areas.)
(2) To develop information for predicting the changes in the salinity content of soil and drainage water resulting in changes in the quality of irrigation water and in irrigation management.
(3) Managing water in the soil-plant matrix to control the quality and quantity of return flow.
(4) Contamination of surface and drainage waters with soil and foliar herbicides. There will be special emphasis on heavy rates used on canal banks, drains, waterways, etc. It is anticipated that as the specific segments or sub-projects are completed, the studies will be expanded to include the broad aspects of water management. This would include such things as consolidation of irrigation companies for water quality control. It would also encompass the ecomics of water quality improvement & protection.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13040 DDG

TITLE OF PROJECT: "Animal Waste Management - Demonstration of Feasible Handling and Treatment Processes"

GRANTEE:

New York State College
of Agriculture
Cornell University
Ithaca, N. Y.

PROJECT DIRECTOR:

Raymond Loehr
Dept. of Agricultural Engineering
Cornell University

Project Site: Ithaca, N. Y.

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	May 15, 1969	**Project Cost:**	$399,996
Completion Date:	May 1972	**Federal Cost:**	$194,095

DESCRIPTION OF PROJECT

The objectives of this project are to design, construct, and demonstrate the applicability of a treatment system, based on laboratory results, for the removal of organic matter, nitrogen, phosphorous, and color from dairy cattle and poultry wastes.

Project Officer: Marion R. Scalf, Robt. S. Kerr Water Research Center, Ada, Oklahoma 74840.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13040 DEM, Rev.

TITLE OF PROJECT: "Characteristics of Wastes from Southwestern Cattle Feedlots"

GRANTEE:
Texas Technological College
Water Resources Center
P.O. Box 4630
Lubbock, Texas 79409

PROJECT DIRECTOR:
Dan M. Wells
Water Resources Center
Texas Technological College
Lubbock, Texas

Project Site: Lubbock, Texas

SPECIFIC DATA ABOUT THIS AWARD

Award Date: July 1969

Completion Date: June 30, 1970

Project Cost: $96,660

Federal Cost: $74,955

DESCRIPTION OF PROJECT

The objectives of this project are to determine the characteristics of wastes in southwestern cattle feedlots, to evaluate waste control and removal techniques, and to develop criteria for the design and operation of feedlots to minimize water pollution. The project will conduct complete analyses of wastes produced by feeder cattle raised under specific feeding and managment regimes and various climatic conditions, correlate data obtained, and from these data develop guidelines for construction and operation of cattle feedlots from the standpoint of minimizing water pollution.

Project Officer: Marion R. Scalf, Robert S. Kerr Water
Research Center
Ada, Oklahoma

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13040 DPA

TITLE OF PROJECT: "Tertiary Treatment of Animal Waste Waters"

GRANTEE:	PROJECT DIRECTOR:
New York State College of Agriculture Cornell University Ithaca, New York 14850	Raymond C. Loehr Cornell University Ithaca, New York 14850

Project Site: Ithaca, New York

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 1, 1969	Project Cost: $90,400
Completion Date: May 1971	Federal Cost: $78,655

DESCRIPTION OF PROJECT

The objectives of this project are to: evaluate feasible processes applicable to the remocal of nitrogen, phosphorus, and color from animal waste waters, especially intermittent, concentrated waste waters; and indicate the most feasible processes and the manner they may be integrated to treat actual animal wastes. Laboratory scale studies shall be performed to apply such processes as ammonia stripping, denitrification and combined phosphorus precipitation and color removal on dairy cattle and poultry wastes.

Project Officer: Marion R. Scalf, Robert S. Kerr Water Research
Center
Ada, Oklahoma 74840

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5 Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 1304 DPS

TITLE OF PROJECT: "Pollution Abatement from Cattle Feedlots in Northeastern Colorado and Eastern Nebraska"

CONTRACTOR:

Agricultural Research Service
Washington, D.C. 20250

PROJECT DIRECTOR

Dr. C.E. Evans
Agricultural Research Service
Post Office Box E
Fort Collins, Colorado

Project Site: Fort Collins, Colorado; Lincoln, Nebraska

SPECIFIC DATA ABOUT THIS AWARD

Award Date:

Project Cost: $307,000

Completion Date: June 1971

Federal Cost: $152,000

DESCRIPTION OF PROJECT

The proposal was negotiated and revised in accordance with program priority and technical needs recommended by the project reviewers. The project will determine the extent and kinds of microbial, chemical and organic pollitants entering the atmosphere, soils, and surface and underground water supplies from cattle feedlots in two contracting climatic zones, northeastern Colorado with annual precipitation of 14-15 inches and eastern Nebraska with annual precipitation of 27-28 inches. It will also evaluate different feedlot management systems for their effectiveness and efficiency in disposing of both liquid and solid wastes under two different climatic conditions.

Project Officer: Ronald Ritter, R&D, FWQA Missouri Basin, Kansas City, Missouri 64106.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section
Federal Water Pollution Control Act, As Amended. 6

PROJECT NUMBER: 13040 EGH

TITLE OF PROJECT: "The Utilization/Disposal of Cattle Feedlot Waste by Pyrolysis"

CONTRACTOR:	PROJECT DIRECTOR
Midwest Research Institute Kansas City, Missouri	Dr. Thomas Garner Midwest Research Institute Kansas City, Mo.

Project Site: Kansas City, Missouri

SPECIFIC DATA ABOUT THIS AWARD

Award Date: March 17, 1970	Project Cost: $75,000
Completion Date: March 16, 1971	Federal Cost: $75,000

DESCRIPTION OF PROJECT

The objectives of this project are (a) to determine on a pilot scale the type and amount of products that can be produced by pyrolyzing cattle feedlot waste at various temperatures and pressures and under various inert atmospheres, and (b) to prepare an exonomic evaluation of the process including capital costs, operating costs, and income from products.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13040 ELI

TITLE OF PROJECT: "Proposal for the Development & Demonstration of Methods for Treatment of Dairy Farm Wastewaters"

GRANTEE:
H. L. Mills,
Brooklawn Dairy Farm
Route 1
Hagerstown, Maryland 21740

PROJECT DIRECTOR:
Dr. David S. Kappe
Kappe Associates, Inc.
P.O. Box 1036
Rockville, Maryland 20850

Project Site: Hagerstown, Maryland

SPECIFIC DATA ABOUT THIS AWARD

Award Date: Feb. 6, 1970

Project Cost: $183,860

Completion Date: Dec. 31, 1972

Federal Cost: $128,702

DESCRIPTION OF PROJECT

The objectives of the proposed project are basically to develop, to evaluate, and to demonstrate a treatment system that will be able to satisfactorily treat the animal wastes and runoff from dairy cattle holding areas.

The envisioned system will effect treatment biologically and will operate on an automated "fill and draw" basis. This basis of operation has the advantages that it obviates the need for an expensive settling tank and lends itself quite nicely to the intermittent demands of the usual dairy farm work schedule. The system will consist of an aerated grit separator; an aeration tank, which, for experimental purposes, will be divided into two independently operable sections; a blower and pump building; a chlorine contact tank; and means for using the chlorinated effluent for washing down the system and the holding area.

Project Officer: Hal Snyder, FWQA Mid-Atlantic, Charlottesville, Va.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13040 EOL

TITLE OF PROJECT: "Automated System for Water Pollution Control from an Animal Production Unit"

GRANTEE:
Ohio State University
Columbus, Ohio 43210

PROJECT DIRECTOR:
Dr. E. Paul Taiganides
Agricultural Engineering Department
The Ohio State University
2073 Neil Avenue
Columbus, Ohio 43210

Project Site: Columbus, Ohio

SPECIFIC DATA ABOUT THIS AWARD

Award Date: December 29, 1969

Project Cost: $78,130

Completion Date: December 1971

Federal Cost: $50,575

DESCRIPTION OF PROJECT

The specific objectives of the project are: (1) to demonstrate to animal producers the type of waste treatment unit operations which could be used to process wastes from animal protection units (2) to demonstrate a system of automated handling of animal wastes (3) to demonstrate an animal waste treatment system which would not create a public nuisance and whose effluent could be of such quality that it could not contribute to water pollution.

The wastes from a 500-pig confinement unit will be flushed into a settling tank. The supernatant of the tank will be processed by aeration in an oxidation ditch, clarified, chlorinated and recirculated through the animal building as flushing water. The solids settled out of the settling tank will be stored in a storage tank which will have a capacity of 90-day detention time. The solids will then be disposed by field spreading.

Project Officer: Duane Traylor, Cincinnati Water Research Lab.
Cincinnati, Ohio

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13040 ERR

TITLE OF PROJECT: "Demonstration of a Recirculating Swine Waste Treatment System Using an RBC"

GRANTEE:	PROJECT DIRECTOR:
Iowa State University Ames, Iowa 50010	Dr. J. Ronald Miner Iowa State University Ames, Iowa 50010

Project Site: Ames, Iowa

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	March 12, 1970	Project Cost:	$273,849
Completion Date:	January 1972	Federal Cost:	$163,299

DESCRIPTION OF PROJECT

The overall objective of this project is to demonstrate the feasibility of using the facilities. The specific objectives are as follows: (1) Demonstrate the effectiveness of a flushing gutter system for handling manure from a hog finishing building. (2) Demonstrate the effectiveness of the Rotating Biological Contractor system in treating overflow from an anaerobic lagoon receiving liquid hog manure, (3) Demonstrate the suitability of using treated waste water as the flushing medium for a hog finishing building. (4) Determine the operating costs and management skills required to operate this waste management system.

Project Officer: Marion R. Scalf, Robert S Kerr Water Research Center
Ada, Oklahoma 74840

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.
WASHINGTON D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6(b)
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13040 EVM

TITLE OF PROJECT: "Demonstration of a Waste Treatment System for Confined Hog-Raising Operations"

GRANTEE:
Shuster Farms
Gower, Missouri 64454

PROJECT DIRECTOR:
Lee R. Shuster
Shuster Farms
Gower, Missouri 64454

Project Site: Gower, Missouri

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 9, 1970	Project Cost: $116,155
Completion Date: March 1, 1972	Federal Cost: 78,300

DESCRIPTION OF PROJECT

This project includes biological treatment and stabilization of wastes from a confined hog-feeding operation. Processes include modified extended aeration, final stabilization and cropland disposal of final effluent and solids. System economics and design criteria are to be developed for potential use at other similar installations. Quality determinations of raw wastes, system inflows and outflows, and in-system waste streams are to be included.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.
WASHINGTON D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13040 EYX

TITLE OF PROJECT: "Conference of the Role of Agriculture in Clean Water"

GRANTEE:
Iowa State University
Ames, Iowa 50010

PROJECT DIRECTOR:
Mr. T. L. Willrich
Iowa State University
Ames, Iowa

Project Site: Ames, Iowa

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	December 24, 1969	Project Cost:	$13,100
Completion Date:	Conference Completed	Federal Cost:	$ 5,500

DESCRIPTION OF PROJECT

The grant award is to support publication of the proceddings of the "Conference." Subjects covered in the conference are "Sediment as a Water Pollutant, Plant Nutrients as a Water Pollutant," Pesticides as Water Pollutants," and "Animal Wastes as Water Pollutants."

Proceedings now at publisher.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6(b)
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13040 FTX

TITLE OF PROJECT: "Waste Treatment Facilities Demonstration - Union Stockyards Company"

GRANTEE:	PROJECT DIRECTOR:
West Fargo Union Stockyards Co. West Fargo, North Dakota 58078	Mr. Clifford Moore Moore Engineering Company West Fargo, North Dakota 58078

Project Site: West Fargo, North Dakota

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 1, 1970	Project Cost: $76,532
Completion Date: September 30, 1971	Federal Cost: $53,572

DESCRIPTION OF PROJECT

This project involves the use of biological stabilization ponds for the treatment of stockyard wastes. Inflow and effluent quality is to be monitored along with system efficiency. Of primary significance is the evaluation of this type of system for stockyard waste disposal in cold climates.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

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Release Date: June 4, 1970

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13040 FUU

TITLE OF PROJECT: "Abstract Service on Animal Waste Technical Literature"

GRANTEE: Iowa State University
Department of Agriucltural Engineering
Ames, Iowa 50010

PROJECT DIRECTOR: J. Ronald Miner

Project Site: Ames, Iowa

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 6, 1970	Project Cost:	$25,844
Completion Date:	May 31, 1971	Federal Cost:	$21,280

DESCRIPTION OF PROJECT

An abstract service of technical literature related to animal waste control is to be provided. Subject areas will include pollutional effects, waste characteristics, management systems, treatment, disposal, and utilization.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.
WASHINGTON D. C. 20242

RELEASE DATE: May 8, 1970

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6(b), Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13040 FWB

TITLE OF PROJECT: "Soil Treatment of Cattle Feedlot Runoff"

GRANTEE:
Meat Producers, Inc.
Route 1
Melissa, Texas 75071

PROJECT DIRECTOR:
Mr. Eldon Merritt, General Manager
Route 1
Melissa, Texas 75071

Project Site: McKinney, Texas

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 15, 1970

Project Cost: $27,200

Completion Date: June 1, 1971

Federal Cost: $16,300

DESCRIPTION OF PROJECT

The project involves utilizing the effluent from a 12,000 head cattle feedlot operation to spray irrigate controlled land disposal areas to reduce organic and nutrient pollution discharged to the water course. Irrigated areas are to be cropped with high nitrogen using grasses and evaluated as a feasible means for using feedlot runoff.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER Quality CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 13040 FXG

TITLE OF PROJECT: "Evaluation of Beef Feedlot Waste Management Alternatives"

GRANTEE:
Oklahoma State University
Stillwater, Oklahoma 74074

PROJECT DIRECTOR:
Dr. Allen F. Butchbaker
Department of Agricultural Engineering
Oklahoma State University
Stillwater, Oklahoma 74074

Project Site: Department of Agricultural Engineering, Stillwater, Oklahoma

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	May 20, 1970	Project Cost:	$39,640
Completion Date:	Feb. 28, 1971	Federal Cost:	$33,690

DESCRIPTION OF PROJECT

This project incorporates computer techniques to aid in developing new feedlot design criteria where waste disposal alternatives are included. Literature reviews and site visits will be employed to prescribe current feedlot design and waste disposal practices. Basic design variables for feedlots (including waste disposal systems) will be programed to develop minimum cost feedlot design criteria.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 --- (PH36-66-107)

TITLE OF PROJECT: "Oxygenation of Ferrous Iron: The Rate-Determining Step in the Formation of Acidic Mine Drainage"

GRANTEE OR CONTRACTOR:	PROJECT DIRECTOR:
Harvard University Cambridge, Massachusetts 02138	Dr. Werner Stumm

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost:	$39,734.00	Obligation Date:	April 1, 1966
Total Federal Cost:	$39,734.00	Completion Date:	June 1969

FINAL REPORT:

TITLE: OXYGENATION OF FERROUS IRON (14010 --- 6/69)

Abstract:

An account of the equilibrium and kinetic relationships which describe and control the distribution and activity of aqueous iron in natural waters is reported. Special emphasis is placed on the kinetics of oxygenation of iron (II), its application to deferrization processes, and its involvement in the formation of acidic coal mine drainage.

The equilibrium relationships which govern the solubilities of ferrous and ferric iron are considered. Included is a redetermination of the solubility product of ferrous carbonate and an estimate of the stability constant for a possible bicarbonato-complex of Fe(II).

The kinetics of the oxygenation of ferrous iron are discussed in both neutral and acidic systems. The rate of oxygenation of ferrous iron over the entire pH-range of interest in natural water is described.

Copies available from the Clearinghouse, Springfield, Virginia 22151 (189 233) $3.00

This project was completed under the auspices of the
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 DAX

TITLE OF PROJECT: "Lime/Limestone Neutralization of Acid Mine Drainage"

GRANTEE:
Peabody Coal Company
301 N. Memorial Drive
St. Louis, Missouri 63102

PROJECT DIRECTOR:
Alten Grandt, General Manager
Landuse & Conservation Dept.
Peabody Coal Company
Farmington, Illinois 61531

Project Site: Carrier Mills, Illinois

SPECIFIC DATA ABOUT THIS AWARD

Award Date: November 6, 1968

Project Cost: $692,000.00

Completion Date: May 6, 1971

Federal Cost: $472,400.00

DESCRIPTION OF PROJECT

This project is for the design, construction and operation of a full scale demonstration plant for the neutralization of acid mine drainage utilizing lime and limestone. Project objectives are to develop techniques to optimize neutralization efficiency, minimize chemical and operating costs and to obtain information for application of this process at other locations.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.
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CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 DAY

TITLE OF PROJECT: "Inorganic Sulfur Oxidation by Iron-Oxidizing Bacteria"

GRANTEE:

Syracuse University Research Institute
Syracuse, N. Y. 13210

PROJECT DIRECTOR:

Donald G. Lundgren
Professor of Microbiology

Project Site: Syracuse, N. Y.

SPECIFIC DATA ABOUT THIS AWARD

Award Date: August 7, 1968

Completion Date: August 6, 1971

Project Cost: $117,575.00

Federal Cost: $ 98,450.00

DESCRIPTION OF PROJECT

The objective of this project is to assess the role of inorganic sulfur oxidation in maintaining an acid environment required for iron-oxidizing bacteria. These bacteria will be investigated as they oxidize inorganic sulfur, since they are common biological catalysts found in acid mine water. Cell free extracts and purified enzymes from sulfur-grown ferrobacilli will be used. Physical and chemical parameters will be examined as regards to their effect on the enzymes.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, *Federal Water Pollution Control Act, As Amended*

PROJECT NUMBER: 14010 DDH

TITLE OF PROJECT: "Demonstration of Control of Acid Drainage from Coal Mine Refuse Piles and Slurry Areas"

GRANTEE:
Truax-Traer Coal Company
Division of Consolidation
Coal Company, Inc.
Chicago, Illinois 60602

PROJECT DIRECTOR:
Gene Long, General Manager
Reclamation and Land Use
Fiatt, Illinois 61433

Project Site: DuQuoin, Illinois

SPECIFIC DATA ABOUT THIS AWARD

Award Date: October 31, 1968

Completion Date: November 1, 1970

Project Cost: $720,800.00

Federal Cost: $490,560.00

DESCRIPTION OF PROJECT

This project is to demonstrate suitable methods for reclamation of coal preparation plant refuse piles and slurry lagoons to eliminate acid drainage. Information derived from this study should provide a rational and engineering procedures for future reclamation projects.

The refuse pile is being prepared for revegetation. The slurry lagoons will be drained to lower the water level prior to its revegetation.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR
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WPCHQ-9200-1
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6, *Federal Water Pollution Control Act, As Amended.*

PROJECT NUMBER: 14010 DEE (14-12-496)

TITLE OF PROJECT: "Treatment of Acid Mine Drainage"

CONTRACTOR:	PROJECT DIRECTOR
Horizons Inc. 2905 East 79th Cleveland, Ohio 44104	Dr. Selwyn Rose Department Head Inorganic Chemistry Dept.

Project Site: Cleveland, Ohio

SPECIFIC DATA ABOUT THIS AWARD

Award Date: February 28, 1969	Project Cost: $49,300.00
Completion Date: February 27, 1970	Federal Cost: $49,300.00

DESCRIPTION OF PROJECT

This project is to investigate the removal of iron and other undesirable metals present in acid mine water by the method of foam fractionation. A continuous flow fractionation system will be constructed, designed to emperically optimize the independent variables controlling separation.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR, WASHINGTON, D. C. 20242

WPCHQ-9200-2
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 DII

TITLE OF PROJECT: "Neutralization and Precoat Filtration of Concentrated Sludges from Mine Water"

GRANTEE:
Commonwealth of Pennsylvania
Dept. of Mines & Mineral Ind.
660 Boas Street
Harrisburg, Pennsylvania 17102
Johns-Manville, Inc.
Project Site: Harrisburg, Pennsylvania

PROJECT DIRECTOR:
Dr. David Maneval

SPECIFIC DATA ABOUT THIS AWARD

Award Date: September 11, 1968

Project Cost: $100,770.00

Completion Date: August 31, 1970

Federal Cost: $70,539.00

DESCRIPTION OF PROJECT

This project is a study on cost-effectiveness evaluation of various neutralization processes in the treatment of acid mine drainage. Sludge disposal problems will be studied with emphasis on precoat filtration. Field tests will be made on four abandoned mines in Western Pennsylvania.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.
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INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 DJL

TITLE OF PROJECT: "The Use of Inert Gases to Eliminate Pollution from Abandoned Mines"

GRANTEE OR CONTRACTOR:

Cyrus Wm Rice Division NUS
Manor Oak Two
1910 Cochran Rd.
Pittsburgh, Pennsylvania 15220

PROJECT DIRECTOR:

Dr. Henry C. Bramer,
Vice President

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $19,689.00

Obligation Date: June 17, 1968

Total Federal Cost: $19,689.00

Completion Date: April 1969

FINAL REPORT:

TITLE: REPORT ON STUDIES OF THE EFFECT OF GAS ATMOSPHERES ON PYRITE OXIDATION (14010 DJL 4/69)

Abstract:

Experiments were conducted to study oxidation of coal mine pyrite under various gas atmospheres (air, nitrogen, nitrogen mixtures with carbondioxide, ammonia and chlorine). In a nitrogen atmosphere, or on switching to nitrogen from air, the discharge quality markedly improved although oxidation products still appeared in he effluent streams. A substantial reduction in sulfate produced in the discharge when air was excluded was observed.

Continuation of this study is FWQA project 14010 ECC. A final report will be available at the conclusion of project 14010 ECC. This report will include both studies.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
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CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, *Federal Water Pollution Control Act, As Amended*

PROJECT NUMBER: 14010 DKN

TITLE OF PROJECT: "Acid Mine Drainage - Pilot Plant Evaluation"

GRANTEE:	PROJECT DIRECTOR:
Carnegie-Mellon University 4400 Fifth Avenue Pittsburgh, Pennsylvania 15213	Robert A. Baker Carnegie-Mellon University

Project Site: Pittsburgh, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	January 8, 1969	Project Cost:	$63,910.00
Completion Date:	June 30, 1970	Federal Cost:	$57,518.00

DESCRIPTION OF PROJECT

The project will demonstrate the feasibility of a method for quantification of biological-chemical reactions and their rates of production of acid mine water. The study involves a systematic application of selected environmental and physical factors, into a laboratory test model, to stimulate acid mine drainage formation conditions as they occur in the field and measure their effect.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 DLC

TITLE OF PROJECT: "Sulfide Treatment of Acid Mine Drainage"

GRANTEE OR CONTRACTOR:	PROJECT DIRECTOR:
Bituminous Coal Research, Inc. 350 Hochberg Road Monroeville, Pennsylvania 15146	Dr. Richard A. Glenn Manager, Chemical Division

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost:	$77,690.00	Obligation Date:	August 12, 1968
Total Federal Cost:	$54,380.00	Completion Date:	November 1969

FINAL REPORT:

TITLE: "SULFIDE TREATMENT OF ACID MINE DRAINAGE" (14010 DLC 11/69)

Abstract:

This project was a laboratory study of the "LHS" process, the combined addition of limestone and hydrogen sulfide to precipitate iron sulfides from coal mine drainage. The unstable nature of the sulfide sludge, possibility of poly-sulfide formation during treatment, instability of mine waters of the type amenable to treatment, and inadequacies of available gas metering equipment are among the factors which militate against the controlled regulation of hydrogen sulfide feed necessary for successful operation of the process. These factors plus a cost evaluation, concluded that the "LHS" process is less attractive than other mine drainage treatment methods.

Copies available from the Clearinghouse, Springfield, Virginia 22151 (187 866) $3.00

This project was completed under the auspices of the
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CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6, Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 DLI

TITLE OF PROJECT: "Silicate Treatment of Acid Mine Wastes"

CONTRACTOR:

Tyco Laboratories, Inc.
Corporate Research Division
Bear Hill
Waltham, Mass 02154

Project Site: Waltham, Mass.

PROJECT DIRECTOR

Raymond Jasinski, Head
New Technology Department

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 24, 1969

Completion Date: April 30, 1970

Project Cost: $55,412.00

Federal Cost: $55,412.00

DESCRIPTION OF PROJECT

This study is to determine the effect of waterglass (sodium silicate) on coal refuse piles for the abatement of acid drainage, including its neutralization capability and its effect on water retention properties of the sludge formed from this reaction. Studies are being performed on laboratory coal mine refuse piles to obtain data on the use of these silica gels under accelerated simulated field conditions.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 DMO

TITLE OF PROJECT: "Research, Development and Field Testing of Mine Water Pollution Abatement Methods"

GRANTEE OR CONTRACTOR:	PROJECT DIRECTOR:
Halliburton Company P.O. Box 1431 Duncan, Oklahoma 73533	Alan A. Baker Halliburton Company 608 Hawley Building Wheeling, West Virginia

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost:	$328,830.00	Obligation Date:	July 15, 1968
Total Federal Cost:	$328,830.00	Completion Date:	March 1970

FINAL REPORT:

TITLE: INVESTIGATIVE MINE SURVEY OF A SMALL WATERSHED (14010 DMO 3/70-A)

Abstract:

An investigation was conducted to locate hidden or unknown drift mine openings in the Browns Creek Watershed in Harrison County, West Virginia. Thirty unknown openings were discovered in an initial reconnaissance. Additional probing using power driven augers was not successful and was deemed impractical. Three specific areas within the watershed were selected for further scrutiny. The bottom of the highwall line in the strip mined area was determined by land surveyors and this information was plotted on old mine maps to indicate the intersection of the stripping with underground mining. A minimum of 107 mine drifts were shown to be exposed by the 14,500 feet of highwall surveyed in the three areas.

This project was completed under the auspices of the
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CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 DMO

TITLE OF PROJECT: "Research, Development and Field Testing of Mine Water Pollution Abatement Methods"

GRANTEE OR CONTRACTOR:

Halliburton Company
P. O. Box 1431
Duncan, Okalhoma 73533

PROJECT DIRECTOR:

Alan A. Baker
Halliburton Company
608 Hawley Building
Wheeling, West Virginia

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $328,830.00

Obligation Date: July 15, 1968

Total Federal Cost: $328,830.00

Completion Date: March 1970

FINAL REPORT:

TITLE: NEW MINE SEALING TECHNIQUES FOR WATER POLLUTION ABATEMENT (14010 DMO 3/70)

Abstract:

This project developed and field tested new concepts for watertight mine seal and bulkhead construction applicable mined proper materials, equipment and techniques for constructing mine seals or bulkheads. Two new processes were developed. One involved a technique of placing a plug of graded limestone aggregate in a mine drift or portal to neutralize an acid mine water discharge until a seal was effected. In the process, precipitation of iron hydroxide gradually closed the pores. The second process consisted of remotely constructing a mine seal including rear and front bulkheads of a self-supporting, quick-setting sodium silicate cement specifically developed for this application. Field testing in West Virginia substantiated the feasibility of both processes when two aggregate and two bulkhead type seals were placed in abandoned mines. Cost of the seals are reported.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, *Federal Water Pollution Control Act,* As Amended

PROJECT NUMBER: 14010 DRB

TITLE OF PROJECT: "Flocculation & Clarification of Mineral Suspensions

GRANTEE:	PROJECT DIRECTOR:
University of Minnesota Minneapolis, Minnesota 55455	Dr. Iwao Iwasaki Mines Experiment Station

Project Site: Minneapolis, Minnesota

SPECIFIC DATA ABOUT THIS AWARD

Award Date: March 6, 1970	Project Cost: $13,331.00
Completion Date: September 30, 1970	Federal Cost: $11,484.00

DESCRIPTION OF PROJECT

The study will investigate clarification of some mineral beneficiation plant effluents by studying the mechanism for the improvement of floccutation. Data is being accumulated on laboratory results to correlate this flocculation and clarification behavior of reagents on plant effluents.

This award is for the second year of a project originally obligated December 27, 1968. The total project cost including this award is $23,723.00 and the total Federal cost is $20,782.00.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,

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INFORMATION SHEET

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6,
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 DRZ

TITLE OF PROJECT: "Feasibility of the Purification of Acid Mine Water by a Partial Freezing Process"

GRANTEE:
Commonwealth of Pennsylvania
Dept. of Mines & Mineral Ind.
660 Boas Street
Harrisburg, Pennsylvania 17102
Applied Science Laboratories
Project Site: State College, Pennsylvania

PROJECT DIRECTOR:
Dr. David Maneval, Director
of Research & Development

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	July 17, 1968	Project Cost:	$15,000
Completion Date:	December 31, 1969	Federal Cost:	$10,500

DESCRIPTION OF PROJECT

The objectives of the project are:

(1) Assemble information pertinent to the purification of acid mine water from existing publications, report and other scientific literature.

(2) Obtain preliminary experimental test data on the yield and purity of quality product water that can be obtained by a partial freezing process operating on typical acid mine water.

(3) Make preliminary flow diagrams and economic evaluations of possible freezing processes for purifying acid mine water.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6,
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 DSC

TITLE OF PROJECT: "Evaluation of Pollution Abatement Procedures in the Moraine State Park, Butler County, Pa.

GRANTEE:
Commonwealth of Pennsylvania
Dept. of Mines & Mineral Ind.
660 Boas Street
Harrisburg, Pennsylvania 17102
Gwin Engineers, Inc.
Project Site: Butler County, Pennsylvania

PROJECT DIRECTOR:
Dr. David Maneval
Director of Research and
Development

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	July 17, 1968	Project Cost:	$21,600.00
Completion Date:	July 30, 1971	Federal Cost:	$15,120.00

DESCRIPTION OF PROJECT

The project is to study the effectiveness of various remedial procedures which have been applied to a large Western Pennsylvania State Park. Evaluation will be made relative to wide spread application of specific pollution abatement projects. Water quality and quantity measurements will be made at sampling points throughout the Muddy Creek Watershed.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 DSD

TITLE OF PROJECT: "Catawisa Creek Mine Drainage Pollution Abatement Project"

GRANTEE:
Commonwealth of Pennsylvania
Dept. of Mines & Mineral Ind.
660 Boas Street
Harrisburg, Pennsylvania 17102
Gannett, Flemming, Corddry & Carpenter, Inc.

PROJECT DIRECTOR:
Dr. David Maneval
Director of Research and Development

Project Site: Schuylkill & Luzerne Co. Pa.

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	July 17, 1968	Project Cost:	$522,200.00
Completion Date:	March 16, 1973	Federal Cost:	$365,540.00

DESCRIPTION OF PROJECT

This project is designed to confirm previous estimates of mine drainage pollution abatement and to evaluate the at-source control method of inundation of a mine by plugging three existing drainage tunnels within an isolated pocket of coal. Inundation of the mine will attempt to prevent acid mine drainage formation by displacing the air with water.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, *Federal Water Pollution Control Act*, As Amended

PROJECT NUMBER: 14010 DTC

TITLE OF PROJECT: "Microbial Mediation in Generation of Acid Mines Wastes"

GRANTEE:

President & Fellows of
Harvard College
1350 Massachusetts Ave.
Cambridge, Massachusetts 02138

PROJECT DIRECTOR:

Dr. Warner Stumm
Professor of Applied Chemistry

Project Site: Cambridge, Massachusetts

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 10, 1969

Project Cost: $27,018

Completion Date: September 30, 1970

Federal Cost: $25,667

DESCRIPTION OF PROJECT

The study will attempt to determine the origin and role of autotrophic bacteria in acid mine water. A field method, using radioactive carbon, will be developed to measure the synthetic activity of autotrophic iron bacteria in situ. A comparison of mine waters which differ in the rate of acidity production will be made in an attempt to elucidate the chemical and biological factors responsible for these differences. These and other factors will be evaluated with regard to possible control of microbial activity and in turn of acid mine water generation.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6, *Federal Water Pollution Control Act,* As Amended.

PROJECT NUMBER: 14010 DYG (14-12-525)

TITLE OF PROJECT: "Acid Mine Waste Treatment Utilizing a Reverse Osmosis Pilot Plant"

CONTRACTOR:	PROJECT DIRECTOR
Gulf General Atomic, Inc. P. O. Box 608 San Diego, California 92112	Dr. Seymour S. Kremen

Project Site: Norton, West Virginia

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	April 7, 1969	Project Cost:	$106,500.00
Completion Date:	October 6, 1970	Federal Cost:	$106,500.00

DESCRIPTION OF PROJECT

This project consists of engineering services and equipment necessary to provide a 4,000 gpd reverse osmosis unit for field operation. FWQA personnel will be instructed and supervised on its operation and will conduct a series of field tests. Laboratory experiments and investigations will support the overall project.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR, WASHINGTON, D. C. 20242

WPCHQ-9200-2
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6, Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 DYH (14-12-518)

TITLE OF PROJECT: "Treatment of Acid Mine Drainage

CONTRACTOR:	PROJECT DIRECTOR
Catalytic Construction Co. 1528 Walnut Street Philadelphia, Pennsylvania 19102	John F. Gilmore, Sr.

Project Site: Norton, West Virginia

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	April 7, 1969	Project Cost:	$327,629
Completion Date:	April 6, 1972	Federal Cost:	$327,629

DESCRIPTION OF PROJECT

This project will apply the desulfating process to acid mine water. The mine water will be neutralized to oxidize and precipitate hydrated iron oxide and other metalic oxides. The solids will be removed in a continuous clarifier, dewatered, calcined and processed for disposal or resale. Clarifier effluent will be contacted with a cation exchange resin (barium form), freeing the water of sulfate ion and precipitating barium sulfate. The resins will be separated by screening and recyled for regeneration. The water barium mixture flows to clarifier thickener where water leaves process. Barium will be reprocessed and returned to the system.

WPCHQ-9200-2
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Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

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RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6, *Federal Water Pollution Control Act, As Amended.*

PROJECT NUMBER: 14010 DYI (14-12-529)

TITLE OF PROJECT: "Treatment of Acid Mine Drainage - Sulfur and Iron Recovery"

CONTRACTOR:	PROJECT DIRECTOR
Black, Sivalls & Bryson, Inc. 7500 East Twelfth Kansas City, Missouri 64126	J. A. Karnavas 538 Alpha Drive Pittsburgh, Pa. 15238

Project Site: Pittsburgh, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	April 18, 1969	Project Cost:	$233,702
Completion Date:	October 17, 1970	Federal Cost:	$233,702

DESCRIPTION OF PROJECT

This project is an engineering feasibility study to determine the applicability and economics of treating acid mine water using a process that will produce sulfur and pure water. In this process, acid mine water is distilled with energy generated from inexpensive high-sulfur coal. The coal is combusted in a liquid iron both to recover its sulfur content in a slag, from which elemental suflur is recovered via a modified Claus process.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

WPCHQ-9200-2
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 DYK

TITLE OF PROJECT: "Abatement of Acid Mine Drainage Pollution by Reverse Osmosis

GRANTEE:
Commonwealth of Pennsylvania
Dept. of Mines & Mineral Ind.
660 Boas Street
Harrisburg, Pennsylvania 17102
Rex-Chainbelt, Inc.

PROJECT DIRECTOR:
Dr. David R. Maneval
Director of Research
and Development

Project Site: Shickshinney, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	February 13, 1969	Project Cost:	$39,426
Completion Date:	December 31, 1969	Federal Cost:	$27,598

DESCRIPTION OF PROJECT

The objectives of this project are to establish the technical parameters for the design, construction and operation of a 10,000 GPD reverse osmosis plant using the hollow tube concept.

The results of this project would allow a full scale (312,000 GPD) plant to be designed.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, *Federal Water Pollution Control Act, As Amended*

PROJECT NUMBER: 14010 DZM

TITLE OF PROJECT: "A Demonstration of a New Mining Technique to Prevent the Formation of Mine Acid in an Active Deep Mine"

GRANTEE:
Island Creek Coal Co.
Island Creek Division
Holden, West Virginia 25625

PROJECT DIRECTOR:
R. C. Taliaferro

Project Site: Holden, West Virginia

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 30, 1970	**Project Cost:**	$831,770.00
Completion Date:	October 31, 1971	**Federal Cost:**	$582,239.00

DESCRIPTION OF PROJECT

This project is Phase II of a program to demonstrate that mining coal in an oxygen free atmosphere will prevent the formation and subsequent discharge of mine drainage pollution into streams and other water courses. The objective of Phase II is to test the important systems, especially the life support system, in an active ventilated mine and prepare a detailed design of the demonstration mine including estimated costs of construciton and operation.

The Phase I project was a system engineering evaluation that determined the feasibility of mining in an inert gas atmosphere using "space age technology."

This award is for the second year of a project originally obligated August 1, 1969. The total project cost including this award is $932,025.00 and the total Federal cost is $652,417.00.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6, *Federal Water Pollution Control Act, As Amended.*

PROJECT NUMBER: 14010 EAH

TITLE OF PROJECT: "Pyritic Systems: A Mathematical Model"

CONTRACTOR:	PROJECT DIRECTOR
The Ohio State University Research Foundation 1314 Kinnear Road Columbus, Ohio 43212	Prof. Edwin E. Smith Dept. of Chemical Eng.

Project Site: Columbus, Ohio

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	October 29, 1969	Project Cost:	$68,918.00
Completion Date:	October 28, 1971	Federal Cost:	$68,918.00

DESCRIPTION OF PROJECT

A mathematical model of pyricic chemical systems will be developed to evaluate the interactions of variables involved in pyrite-acid mine water formation. The rate of pollution discharge as a function of these variables can then be predicted. The model will be developed with the aid of a digital computer and will be verified from data collected at two mine drainage sites.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

WPCHQ-9200-2
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5, Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 ECC (14-12-877)

TITLE OF PROJECT: "Continuation of the Laboratory Investigations of the Effects of Various Gas Atmospheres of the Oxidation Coal Mine Pyrites"

CONTRACTOR:	PROJECT DIRECTOR
Cyrus Wm. Rice Division NUS Corporation 1910 Cochran Road Pittsburgh, Pennsylvania 15220	Mr. J. C. Troy Vice President

Project Site: Pittsburgh, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 2, 1970	Project Cost: $53,601.00
Completion Date: January 2, 1971	Federal Cost: $53,601.00

DESCRIPTION OF PROJECT

The overall objective of this project is to determine the effect of various gas atmospheres on the oxidation of coal mine pyrites. This work would be a continuation of similar inert gas laboratory studies which the contractor completed under a previous FWQA contract. The results of the experiments should further clarify the question of the oxidation of coal mine pyrites blanketed by various gas atmospheres as well as place the work of previous investigators into perspective so that guidelines for field application of this technique can be set.

WPCHQ-9200-2
(3-70)

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, *Federal Water Pollution Control Act, As Amended*

PROJECT NUMBER: 14010 EFJ

TITLE OF PROJECT: "Study of the Use of In-situ Precipitation of Sludge Resulting from Rejection of Mine Water with Low Cost Additives in an Abandoned Mine to Prevent Mine Drainage Pollution"

GRANTEE:	PROJECT DIRECTOR:
Commonwealth of Pennsylvania Dept. of Mines & Mineral Ind. 660 Boas Street Harrisburg, Pennsylvania 17102 Parsons-Jurdens, Inc.	Dr. David D. Maneval Director of Research Development

Project Site: Elder Township, Cambria, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 25, 1968

Completion Date: June 30, 1971

Project Cost: $325,035.00

Federal Cost: $277,524.00

DESCRIPTION OF PROJECT

This project is intended to demonstrate an in-situ technique for minimizing acid mine drainage. A mixture of neutralizing material such as brine, an inert filler and gelling additives will be injected, as a slurry, into the mine at predetermined intervals. A simi-solid plug will form which will restrict air and water flow through the mine. The material will also neutralize a part of the already formed acid material and coat some of the pyrites.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 EFK

TITLE OF PROJECT: "Use of Latex as a Soil Sealant to Control Acid Mine Waste Drainage"

GRANTEE:
Commonwealth of Pennsylvania
Dept. of Mines & Mineral Ind.
660 Boas Street
Harrisburg, Pennsylvania 17102
Uniroyal, Inc.

PROJECT DIRECTOR:
Dr. David D. Maneval
Director of Research
and Development

Project Site: Copper Township, Clearfield County, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 26, 1968	Project Cost:	$259,770.00
Completion Date:	December 9, 1970	Federal Cost:	$181,839.00

DESCRIPTION OF PROJECT

The project will demonstrate the use of rubber latex to form a soil seal in an attempt to prevent or reduce acid mine drainage without interfering with vegetative growth. The method consists of allowing a rubber latex to leech into the soil below the root line and then coagulating it either by the natural acid reaction of the soil or by an artificial acid plateau.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR
WASHINGTON D. C. 20242

WPCHQ-9200-1
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 EFL

TITLE OF PROJECT: "Study of the Use of Inert Gas to Eliminate Acid Pollution from Abandoned Deep Mines"

GRANTEE:
Commonwealth of Pennsylvania
Dept. of Mines & Mineral Ind.
660 Boas Street
Harrisburg, Pennsylvania 17102
C.W. Rice, Division of NUS Corp.

PROJECT DIRECTOR:
Dr. David D. Maneval
Director of Research
and Development

Project Site: Ohiopyle State Park, Fayette County, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 6, 1968

Project Cost: $126,143.00

Completion Date: June 5, 1970

Federal Cost: $83,784.00

DESCRIPTION OF PROJECT

An abandoned drift mine of approximately 200 acres will be sealed, and air-blowing and monitoring equipment installed. The air leak rate from the mine will be determined by correlating variable air input rates to the changes in the barometric pressures and temperatures in the mine.

The initial phase of this study has been concluded and reported. The continuation of this project will be concerned with an evaluation of the state-of-the-art of existing technology to locate air leakage from the mine; installation of air seals; and continuation of the original study to pressurize the mine with an inert gas.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, *Federal Water Pollution Control Act, As Amended*

PROJECT NUMBER: 14010 EFN

TITLE OF PROJECT: "Construction of Mine Water Treatment Plant at Hollywood, Pennsylvania"

GRANTEE:
Commonwealth of Pennsylvania
Dept. of Mines & Mineral Ind.
660 Boas Street
Harrisburg, Pennsylvania 17102
Pennsylvania State University
Project Site: Hollywood, Pennsylvania

PROJECT DIRECTOR:
Dr. David D. Maneval
Director of Research
and Development

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	March 28, 1968	Project Cost:	$1,000,000.00
Completion Date:	June 30, 1971	Federal Cost:	$700,000.00

DESCRIPTION OF PROJECT

This project is a demonstration of the treatment of acid mine waters by neutralization. Investigations of five basic treatment processes comprise the actual demonstration study in this 500,000 gallon per day plant. These five processes are as follows: (1) flash mixing, aeration and settling; (2) flash mix, aeration, thickening, settling; (3) thickening (with lime), sludge recycle, supernatant discharge; (4) biological oxidation tank, thickening, limestone reactor, settling; and (5) trickling filter, thickening, limestone reactor, settling.

Construction of this plant has been completed and the plant was dedicated June 27, 1970.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 EGJ

TITLE OF PROJECT: "Application of Bacteriophages to Eliminate Mine Acids"

GRANTEE OR CONTRACTOR:
Commonwealth of Pennsylvania
Dept. of Mines & Mineral Ind.
660 Boas Street
Harrisburg, Pennsylvania 17102
MSA Research Corp.

PROJECT DIRECTOR:
Dr. David D. Maneval
Director of Research
and Development

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost:	$123,723.00	**Obligation Date:**	June 6, 1968
Total Federal Cost:	$86,484.00	**Completion Date:**	September 1969

FINAL REPORT:

TITLE: "Effect of Antibacterial Agents on Mine Drainage (14010 EGJ 11/69)

Abstract: A laboratory study was conducted to determine the nature of the active agents in certain natural waters that had been previously found to inhibit bacterial production of acid from mine waters. An actual coal mine situation where acid was being produced, was used to determine the feasibility of the application of the inhibitory principle.

Results of the study were inconclusive. No evidence is prevented to adequately determine the effects of antibacterial agents on acid mine drainage. Copies available from the Clearinghouse, Springfield, Virginia 22151 (191215) $3.00.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 EHN

TITLE OF PROJECT: "Detection & Location of Concealed Abandoned Underground Mines & Associated Drainage by Geochemical Techniques"

GRANTEE:
Commonwealth of Pennsylvania
Dept. of Mines & Mineral Ind.
660 Boas Street
Harrisburg, Pennsylvania 17102
H. R. B. Singer, Inc.

PROJECT DIRECTOR:
Dr. David Maneval
Director of Research and Development

Project Site: State College, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 20, 1969
Project Cost: $164,780.00

Completion Date: December 31, 1970
Federal Cost: $115,346.00

DESCRIPTION OF PROJECT

The project will develop new techniques, predominantly geophysical and/or geochemical, for locating concealed mine voids that are discharging acid mine drainage. The suggested methods of detection include such items as electrical resistance, electrical potential, induced polarization, sesimic reflection, as well as infrared and micro-wave radiometry. Geochemical systems which will be evaluated will include ground water analysis, surface water analysis, the use of dyes and/or radioactive isotopes as well as bacteria as tracers.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
DEPARTMENT OF THE INTERIOR,
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CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 EHZ

TITLE OF PROJECT: "Disposal of Sludge from Acid Mine Drainage Treatment Plants"

GRANTEE:
Hi-Hills Ranch, Inc.
Greensboro Star Rt
Waynesburg, Pa. 15370

PROJECT DIRECTOR:
F. W. Niggemeyer
Greensboro Star Rt
Waynesburg, Pa. 13270

Project Site: Bealsville, Pa.

SPECIFIC DATA ABOUT THIS AWARD

Award Date: November 2, 1969

Completion Date: October 31, 1971

Project Cost: $356,000.00

Federal Cost: $189,500.00

DESCRIPTION OF PROJECT

The objective of this project is to determine if the sludge from acid mine drainage neutralization plants can be disposed of by dispersing it on the soil without pollution to streams or ground water. Various types of sprinkling devices on different types of vegetation will be tried. Studies will be made of the sludge, soil, ground water and runoff water over the two growing seasons the project will run.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 EIZ

TITLE OF PROJECT: "Optimization and Development of Improved Chemical Techniques for the Treatment of Coal Mine Drainage"

GRANTEE OR CONTRACTOR:	**PROJECT DIRECTOR:**
Commonwealth of Pennsylvania Dept. of Mines & Mineral Ind. 660 Boas Street Harrisburg, Pennsylvania 17102 Bituminous Coal Research, Inc.	Dr. David D. Maneval Director of Research and Development

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost:	$150,000.00	**Obligation Date:**	February 7, 1968
Total Federal Cost:	$105,000.00	**Completion Date:**	January 1970

FINAL REPORT:

TITLE: "Studies on Limestone Treatment of Acid Mine Drainage (14010 EIZ 1/70)

Abstract: Four coal mine waters have been neutralized with limestone both on a batch scale and by utilizing continuous flow apparatus. Variation in treatment procedure were necessary depending on the characteristics of the individual waters.

A standardized test was established to evaluate the reactivity of the limestones. The following varibles are of importance in evaluating limestones for coal mine water neutralization: (a) particle size, (b) Ca and Mg content, and (c) surface area.

Electrophoretic mobility studies on precipitates obtained by both lime and limestone neutralization of coal mine water yieled information which can be applied for more effective sludge removal.

Data obtained in these studies indicate that the limestone process offers considerable promise for an improved lower cost method for treating several types of coal mine waters.

Copies available from Superintendent of Documents, Washington, D. C. 20046 (14010 EIZ 1/70) $1.25

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 EJE

TITLE OF PROJECT: "Mine Spoil Potentials for Water Quality and Controlled Erosion"

GRANTEE:
West Virginia Board
of Governors
West Virginia University
Morgantown, West Virginia 26506

PROJECT DIRECTOR:
Dr. Richard M. Smith
Department of Agronomy
& Genetics

Project Site: Morgantown, West Virginia

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 30, 1969

Project Cost: $224,028.00

Completion Date: June 30, 1971

Federal Cost: $156,328.00

DESCRIPTION OF PROJECT

The overall goal of this project is to determine the pollution capability of the various strata of soil, rock and ore which compromises the working area of a strip mine. By determining the pollution potential from each of these strata prior to strip mining, a priority for replacing the excavated material can be assigned to ensure the most effective abatement of future mine drainage at that site.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6,
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 EJT

TITLE OF PROJECT: "Recovery of Iron in a More Dense Form from Coal Mine Drainage"

GRANTEE:
Commonwealth of Pennsylvania
Dept. of Mines & Mineral Ind.
660 Boas Street
Harrisburg, Pennsylvania 17102
Bituminous Coal Research, Inc.
Project Site: Pittsburgh, Pennsylvania

PROJECT DIRECTOR:
Dr. David Maneval
Director of Research and Development

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	September 26, 1969	Project Cost:	$81,695.00
Completion Date:	September 25, 1970	Federal Cost:	$57,186.00

DESCRIPTION OF PROJECT

This project is the first phase of a three phase demonstration project concerned with a neutralization process for acid mine water. Phase I involves a bench scale study of the effects of increasing the interfering species, especially Al^{+3} on the formation of a more dense sludge, determination which natural mine waters would be amenable to treatment and development of a conceptual process with cost estimates for this process. Phase II would be concerned with further development of this process including design of a field research unit. Phase III would be construction and operation of this field unit.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: **14010 EKW**

TITLE OF PROJECT: **"Use of Gel Material for Sealing Deep Mine Openings"**

GRANTEE:	PROJECT DIRECTOR:
Commonwealth of Pennsylvania **Dept. of Mines & Mineral Ind.** **660 Boas Street** **Harrisburg, Pennsylvania 17102** **Dravo Corporation**	**Dr. David Maneval** **Director of Research and Development**

Project Site: **Keystone State Park, Pennsylvania**

SPECIFIC DATA ABOUT THIS AWARD

Award Date: **September 19, 1969** Project Cost: **$205,000.00**

Completion Date: **November 18, 1971** Federal Cost: **$143,500.00**

DESCRIPTION OF PROJECT

The project will demonstrate the sealing of a mine opening with the injection of a polymeric material to form an in-situ seal. This would be done thru the drilled hole that locates the mine from the surface. A secondary objective of the project will determine the effect on the ground water of water-sealing of deep mines and creating underground pools. In those instances where the mine has depleted the ground water, it will be determined whether sealing can reestablish a ground water table.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 ELB

TITLE OF PROJECT: "Evaluation of Lime-Soda Ash Treatment of Neutralized Mine Drainage"

GRANTEE:
Commonwealth of Pennsylvania
Dept. of Mines & Mineral Ind.
660 Boas Street
Harrisburg, Pennsylvania 17102
Gwin Engineers
Project Site: Altoona, Pennsylvania

PROJECT DIRECTOR:
Dr. David R. Maneval
Director of Research
and Development

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 18, 1970

Project Cost: $2,598,340.00

Completion Date: February 28, 1973

Federal Cost: $78,930.00

DESCRIPTION OF PROJECT

A full scale lime-soda ash treatment process will be applied to each of four different water sources and evaluated to determine the following:

A. Chemical dosages required to yield finished water which will meet specific water use criteria.

B. Operational factors associated with the process.

C. Operation of the process on various feed water for sufficient time to determine the relevant operating costs and such variables as sludge production and settling rates, ease of continuous operation along with maintenance and labor required.

D. Attempt to evaluate the feasibility and economics of the lime-soda process for municipal and industrial uses on feed waters containing under 500 mg/TDS and over 500 mg/l TDS.

The operational systems provided for this experimental work would include a 7.0 MGD capacity for lime neutralization consisting of rapid mixing, slow mixing, aeration and sedimentation. This will be follwed by a 3.5 MGD capacity reactor-clarifier for the soda softening process with recarbonation, for this final stage of treatment.

WPCHQ-9200-1
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DEPARTMENT OF THE INTERIOR,
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OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

Address inquiries to the attention of Project Coordination

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This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 EMS

TITLE OF PROJECT: "Technical Feasibility and Analysis of Costs and Effectiveness of Bulk Transport of Sewage Treatment Plant Sludge and Dredging Spoils"

GRANTEE OR CONTRACTOR:	**PROJECT DIRECTOR:**
Bechtel Corporation 50 Beale Street San Francisco, California 94105	E. J. Wasp Project Manager

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $279,597.00	**Obligation Date:** April 10, 1968
Total Federal Cost: $279,597.00	**Completion Date:** December 1969

FINAL REPORT:

TITLE: BULK TRANSPORT OF WASTE SLURRIES TO INLAND & OCEAN DISPOSAL SITES (14010 EMS 9/69) Vols. I-III
Summary (14010 EMS 12/69)

Abstract:

This three volume study is concerned with the development of regional land and ocean pipeline disposal systems for digested sewage sludge and maintenance dredgings. Volume I considers a land disposal system of Northeast Ohio (Cleveland-Canton) and an ocean disposal system for the Baltimore-Washington region. A systems approach is used, in which collection, transportation, and disposal aspects are examined. Various transport modes are compared, including pipeline, ocean tankers, railroads, and trucks. The study also considers the expansion of such systems to include fly ash and water treatment plant sludge.

Volume II discusses methods and cost of disposal for all four wastes. Land and ocean disposal alternatives in terms of a general solution is presented for two metropolitan regions, Great Lakes, Buffalo to Milwaukee, and Atlantic Coast, Boston to Norfolk.

Results of a test program for pumping digested sludge, fly ash, and sludge-fly ash slurries are included in Volume III as well as reheological tests. A review of the state of the art of pipelining of waste materials is also included.

Copies available from the Clearinghouse, Springfield, Virginia 22151
Volume I (189 757) Volume II (189 758) Volume III (189 759) Summary (189 756) $3.00.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

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WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5,
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: **14010 ENW**

TITLE OF PROJECT: **"Microbiological Removal of Iron from Mine Drainage Waters"**

GRANTEE:	PROJECT DIRECTOR:
Continental Oil Company P. O. Drawer 1267 Ponca City, Oklahoma	Ray C. Allred Supervising Research Scientist

Project Site: **Ponca City, Oklahoma**

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	September 1, 1967	Project Cost:	$115,996.00
Completion Date:	July 31, 1970	Federal Cost:	$ 75,886.00

DESCRIPTION OF PROJECT

The project will study in the laboratory, the removal of iron from acid mine drainage water using two different microorganisms. Iron oxidizing bacteria will be used to convert the iron from the ferrous form to a ferric precipitate. Then sulfate reducing bacteria will be utilized to precipitate the oron as iron sulfate.

The initial phase of laboratory studies has been completed. Indications are that certain bacteria are capable of oxidizing the ferrous iron, but require modifications to the water temperature and the pH of the mine water discharge. The second phase will determine the applicability of laboratory results under actual field conditions.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,

WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5, *Federal Water Pollution Control Act, As Amended.*

PROJECT NUMBER: 14010 EXA (14-12-97)

TITLE OF PROJECT: "A Pilot-Scale Study of Acid Mine Drainage"

CONTRACTOR:	PROJECT DIRECTOR
Ohio State University Research Foundation 1314 Kinnear Road Columbus, Ohio 43212	Dr. E. E. Smith Associate Professor of Civil Engineering

Project Site: Columbus, Ohio

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 30, 1967	Project Cost:	$79,301.00
Completion Date:	June 30, 1970	Federal Cost:	$79,301.00

DESCRIPTION OF PROJECT

The study will attempt to define the controlling factors and to assess the significance of acidic conditions in abandoned mines, currently inactive ones, and in future mining areas. An attempt will be made to assess the characteristics of acid formation to establish systems to monitor adequately the variables selected, and to attack the problem with suitable abatement measures.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6, Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 FBZ (14-12-847)

TITLE OF PROJECT: "The Effect of Soluble Iron Upon Municipal Waste Treatment Facilities"

CONTRACTOR:	PROJECT DIRECTOR
Resources Engineering Assoc. Environmental Research & Applications, Inc. Wilton, Connecticut 06897	Richard J. Benoit, Ph.D.

Project Site:

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 24, 1970	Project Cost:	$21,745.00
Completion Date:	December 24, 1970	Federal Cost:	$21,745.00

DESCRIPTION OF PROJECT

This project will attempt to determine whether the iron enriched brine, (from mine drainage) from any of several demineralization processes, may be advantageously disposed of through addition to municipal waste sewerage. The current practice of using small amounts of ferric chloride or ferric sulfate in water treatment plants is well documented. This practice greately enhances the coagulation and sedimentation of materials present in waste sewerage. If the waste brine, which contains considerable amounts of ferrous and ferric sulfate may be used in waste treatment plants, it would be highly advantageous to dispose of the significant amounts of minerals in this manner. The present study will be concerned with the physical, chemical and biological effects and advantages of this practice.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5, *Federal Water Pollution Control Act, As Amended.*

PROJECT NUMBER: 14010 FII

TITLE OF PROJECT: "Evaluation of Pyritic Oxidation by Nuclear Methods"

CONTRACTOR:	PROJECT DIRECTOR
Carnegie-Mellon University 4400 Fifth Avenue Pittsburgh, Pennsylvania 15213	Robert A. Baker Senior Fellow Mellon Institute Carnegie-Mellon University

Project Site: Pittsburgh, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date: March 4, 1970	Project Cost: $39,635.00
Completion Date: November 30, 1970	Federal Cost: $35,672.00

DESCRIPTION OF PROJECT

The objective of this project is to explore the oxidation process taking place on the surface of pyritic materials during acid mine drainage formation utilizing the mechanism of Mossbauer spectroscopy. A specific objective is to determine the role of chemoautotrophic organisms in such oxidation mechanisms. There organisms may promote ferrous and sulfide dissolution from pyritic strata, accelerate the oxidation reaction once these ions are present in aqueous solutions or contribute by some combination of these mechanisms.

Natural and synthetic pyrites will be exposed to carefully controlled gaseous and aqueous environments, with and without microorganisms. The nature and rate of reaction products are to be monitored by various chemical and biological techniques with empahsis on Mossbauer effect spectroscopy and radiochemical procedures.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

WPCHQ-9200-2
(3-70)

INFORMATION SHEET

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 FJX

TITLE OF PROJECT: "The Thickening and Dewatering of Precipitates from the Lime/Limestone Treatment of Mine Drainage"

GRANTEE:	PROJECT DIRECTOR:
West Virginia Board of Regents West Virginia University Morgantown, W. Va. 26506	Joseph W. Leonard, Director Coal Research Bureau School of Mines

Project Site: Morgantown, West Virginia

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	February 5, 1970	Project Cost:	$99,938.40
Completion Date:	December 31, 1972	Federal Cost:	$69,956.88

DESCRIPTION OF PROJECT

This project will provide the technical information necessary so that: (1) existing knowledge may be properly applied; and, (2) new or conceptual knowledge may be utilized in order to densify the sludge which results from lime or limestone mine water treatment. Knowledge and procedures in the areas of both chemical and mechanical densification will be employed. Broad areas of specialization which are concerned with these techniques include; coagulation, floccualtion, decantation, filtration, thickening, centrifuging and cycloning.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 FKK

TITLE OF PROJECT: "Mining Operations for the Reduction of Harmful Drainage from Underground Coal Mines"

GRANTEE:	PROJECT DIRECTOR:
West Virginia Board of Regents West Virginia University Morgantown, W. Va. 26506	Joseph W. Leonard, Director Coal Research Bureau School of Mines

Project Site: Morgantown, West Virginia

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	March 4, 1970	Project Cost:	$87,543.40
Completion Date:	August 1, 1972	Federal Cost:	$83,166.23

DESCRIPTION OF PROJECT

The project will be directed toward the ultimate objective of delineating those technically and economically optimum underground coal mine operating practices which are and which can be employed as a means of preventing or substantially reducing the generation and efflux of harmful drainage water. This will be accomplished by: (1) State-of-the-Art publication that delineates technology currently available; (2) Determination and evaluation of practices and techniques currently employed, although not necessarily published; (3) Delineation of those areas where future research effort or practical experimentation is required.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6, *Federal Water Pollution Control Act, As Amended.*

PROJECT NUMBER: 14010 FLW (14-12-848)

TITLE OF PROJECT: "Feasibility Manual for Mine Drainage"

CONTRACTOR:
Cyrus Wm. Rice Division NUS
Manor Oak Two
1910 Cochran Rd.
Pittsburgh, Pennsylvania 15220

PROJECT DIRECTOR
J. K. Rice, President

Project Site Pittsburgh, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	March 4, 1970	Project Cost:	$40,909.00
Completion Date:	June 2, 1970	Federal Cost:	$40,909.00

DESCRIPTION OF PROJECT

The project will develop a manual of guidelines to be used by the States, interstate agencies or consulting engineering firms, for performing feasibility studies of projects proposed to demonstrate methods for the abatement or control, within all or part of a watershed, of mine drainage pollution resulting from active or abandoned mines.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6, *Federal Water Pollution Control Act,* As Amended.

PROJECT NUMBER: 14010 FMH (14-12-838)

TITLE OF PROJECT: "Treatment of Acid Mine Drainage by Ozone Oxidation"

CONTRACTOR:	PROJECT DIRECTOR
U. S. Atomic Energy Commission Upton, Long Island New York 11973	E. L. Van Horn, Manager Brookhaven, National Laboratory

Project Site: Upton, New York

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	March 13, 1970	Project Cost:	$20,000.00
Completion Date:	September 12, 1970	Federal Cost:	$20,000.00

ESCRIPTION OF PROJECT

This is a detailed engineering study and cost evaluation of ozone synthesis and its utilization in treating acid mine drainage by oxidizing ferrous iron to ferric iron. This would aid in decreasing the potential pollution load on the treatment plant and allow lower cost materials and equipment to be used in the plant.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5, Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 FMM (14-12-897)

TITLE OF PROJECT: "Study of the Conversion of Pyrites by Oxidation in Chlorinated Solvents"

CONTRACTOR:	PROJECT DIRECTOR
Cyrus Wm. Rice Division NUS Corporation 1910 Cochran Road Pittsburgh, Pennsylvania 15205	Mr. J. C. Troy Vice President

Project Site: Pittsburgh, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 21, 1970	Project Cost:	$73,810.00
Completion Date:	June 1, 1971	Federal Cost:	$73,810.00

DESCRIPTION OF PROJECT

The project will study the chlorination of pyrites in organic solvents for recovery of iron oxide and sulfur.

It is estimated that the amount of elemental sulfur in refuse could be as much as 10-20 pounds of sulfur per ton of coal produced. Processes have been proposed to recover coal from refuse piles as a means of eliminating the hazard of spontaneous combustion. Such reprocessing obviously produces a final refuse enriched in pyrites. A process that could extract sulfur from pyrites might thus combine with a coal extraction process to produce a final refuse that is neither combustible nor capable of causing water pollution. In addition to sulfur recovery, it is possible that a salable iron oxide might further enhancing conservation of mineral resources.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6, Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 FNJ (14-12-887)

TITLE OF PROJECT: "Acid Mine Drainage Treatment by Ion Exchange"

CONTRACTOR:	PROJECT DIRECTOR
Culligan Incorporated Northbrook, Illinois 60062	Ed Kreusch Project Manager

Project Site: Northbrook, Illinois

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 29, 1970	Project Cost:	$88,483.00
Completion Date:	January 29, 1972	Federal Cost:	$88,483.00

DESCRIPTION OF PROJECT

This project is to study several different ion exchange processes under identical conditions. Laboratory work will be undertaken to establish the operating characteristics of the ion exchange resins, however, no attempt will be made to optimize the system. Rather this will be a survey of proposed systems to determine the applicability to acid mine drainage water. Performance characteristics of the resins will be used to predict full scale plant performance and to estimate the operating cost for complete plants to treat acid mine drainage by several different ion exchange processes.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5,
Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 FNQ (14-12-859)

TITLE OF PROJECT: "Electrochemical Treatment of Acid Mine Waters"

CONTRACTOR:

Tyco Laboratories, Inc.
Corporate Research Division
Bear Hill
Waltham, Massachusetts 02154

PROJECT DIRECTOR

Dr. Bertram Keilin, Head
Environmental Sciences Dept.

Project Site: Waltham, Massachusetts

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	April 21, 1970	Project Cost:	$81,160.00
Completion Date:	April 20, 1971	Federal Cost:	$81,160.00

DESCRIPTION OF PROJECT

The project shall be devoted to determining what parameters are most important in the selective oxidation of ferrous ions in mine drainage waters, with particular emphasis upon attempting to reduce the ferrous ion content to below one percent of the original ferrous concentration. Such items as current efficiency, electrode composition and configuration, and collection of hydrogen gas generated shall have high priority in this study. The economics of the actual operating system shall be considered at all times so that this work shall be devoted to the most practical effort for the actual design of a workable and operating system.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6,
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 FOA

TITLE OF PROJECT: "Coal Refuse Binder"

GRANTEE:

Black, Sivalls, & Bryson, Inc.
538 Alpha Drive
Pittsburgh, Pennsylvania 15238

PROJECT DIRECTOR:

Mr. P. J. LaRosa

Project Site: Pittsburgh, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	March 19, 1970	Project Cost:	$18,894.00
Completion Date:	August 31, 1970	Federal Cost:	$13,226.00

DESCRIPTION OF PROJECT

This process is devoted to the study of the sealing of coal refuse piles with a layer of carbonate-bonded refuse to exclude air and moisture from the pile. This is expected to minimize the formation of acid mine drainage. In the process, lime hydrate is blended with coal refuse and treated with carbon dioxide to form strong calcium carbonate (calcite) crystals. The calcite crystals act as a cementing matrix that converts the refuse into a coherent conceret-like material.

A second application of this process is the elimination of refuse piles by utilizing the refuse material as filler in the construction of carbonate-bonded road pavement and in the manufacture of low cost bricks and similar products.

This project will be mainly concerned with the bench-scale experimental efforts which will be undertaken primarily to determine the operating parameters for generating a strong carbonate-bonded coal refuse that is impervious to air and water. The briquetts so produced will be subjected to compression loading tests and tested for their resistance to air and water migration.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

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CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: **14010 FPQ**

TITLE OF PROJECT: **"Biological Treatment of Acid Mine Water"**

GRANTEE:	PROJECT DIRECTOR:
Syracuse University Research Institute 201 Marshall Street Syracuse, New York 13210 Project Site: Syracuse, New York	Dr. D. A. Rice Assistant Professor of Chemical Engineering

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 11, 1968	Project Cost: $54,341.00
Completion Date: June 10, 1971	Federal Cost: $47,238.00

DESCRIPTION OF PROJECT

This project will gather basic process data on the treatment of acid water in an anaerobic biological reactor containing the species Desulfovibrio desulfoxidans. Subsequently, a set of parametric experiments will be carried out to determine the relationship between ionic concentrations and process conditions. Appropriate mathematical models will be developed to describe the relationships and to indicate controlling mechanisms.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.

WASHINGTON D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 FPR

TITLE OF PROJECT: "Acid Mine Drainage - An Analysis of the State of the Art"

GRANTEE:

The Ohio State University
Research Foundation
1314 Kinnear Road
Columbus, Ohio 43212

PROJECT DIRECTOR:

George P. Hanna, Jr.
Director, Water Resources

Project Site: Columbus, Ohio

SPECIFIC DATA ABOUT THIS AWARD

Award Date: November 28, 1967

Completion Date: June 30, 1969

Project Cost: $28,811.00

Federal Cost: $28,811.00

DESCRIPTION OF PROJECT

This study of the "state of the art" is to provide:

1. A critical and comprehensive review of the literature to date pertaining to the acid mine drainage problem.
2. A review of the current approaches to alleviation of acid mine drainage.
3. Identification of the major areas where new or imporved methods may be applicable to control the mine drainage.
4. An evaluation of the status of current research, and identification of further research needs relating to allevation of the problem.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

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INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 FPS

TITLE OF PROJECT: "Study of Sulfide to Sulfate Reaction Mechanism"

GRANTEE OR CONTRACTOR:

The Ohio State University
Research Foundation
1314 Kinnear Rd.
Columbus, Ohio 43212

PROJECT DIRECTOR:

Dr. E. E. Smith
Associate Professor of
Chemical Engineering

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $152,763.00

Obligation Date: May 20, 1962

Total Federal Cost: $151,402.00

Completion Date: February 1970

FINAL REPORT:

TITLE: Sulfide to Sulfate Reaction Mechanism (14010 FPS 2/70)

Abstract:
The mechanisms and kinetics of the chemical reactions responsible for acid mine drainage were studied.

The mineralogical features of the solid phase reactant (pyrite) that determine its reactivity and the rate-limiting reactions and variables affecting this rate of reactions are described and identified.

It was found that two basic oxidation modes are important: oxygenation, in which oxygen is the immediate oxidizing agent: and ferric ion (or microbiologically catalyzed) oxidation, in which ferric ions are the oxidants. From a knowledge of the dissolved oxygen, ferric/ferrous ratio, and total iron ion content at the reaction site, the reaction regime may possibly be determined.

For a given pyrite surface, oxygenation rate is dependent on the oxygen concentration in the aqueous phase surrounding the reactive site on the pyrite surface. Ferric ion oxidation rate is determined by the ferric/ferrous ratio and free ferric ion concentration in solution, and is not affected by dissolved oxygen.

Copies available Super Documents Washington, D. C. $1.50

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, *Federal Water Pollution Control Act, As Amended*

PROJECT NUMBER: 14010 FQR

TITLE OF PROJECT: "Abatement of Acid Mine Drainage Pollution by Reverse Osmosis"

GRANTEE:
Commonwealth of Pennsylvania
Dept. of Mines & Mineral Ind.
660 Boas Street
Harrisburg, Pennsylvania 17102
Rex-Chainbelt, Inc.
Project Site: Milwaukee, Wisconsin

PROJECT DIRECTOR:
Dr. David R. Maneval
Director of Research
and Development

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 3, 1970	Project Cost:	$69,630.00
Completion Date:	May 30, 1971	Federal Cost:	$48,741.00

DESCRIPTION OF PROJECT

This project will attempt to demonstrate that reverse osmosis can treat acid mine drainage to produce a high quality water. It is an attempt to determine that such waters with a high ferrous ion content may be treated so as to alleviate serious fouling of reverse osmosis membranes by the oxidation of ferrous to ferric ions. This investigation will be carried out by:

1. Laboratory studies, using synthesized AMD, designed to determine exact causes and cures for iron fouling of reverse osmosis membranes.
2. Optimization of alternate flow schemes for RO treatment of AMD with high ferrous iron content.
3. Detailed cost analysis for alternate flow schemes.
4. Sampling of actual mines to determine feasibility of obtaining AMD with no dissolved oxygen content.
5. Field testing to verify the results of lab testing.
6. Engineering evaluation and cost/performance analysis for RO treatment of AMD.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6, Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 14010 FUI (14-12-876)

TITLE OF PROJECT: "Treatment of Acid Mine Drainage"

CONTRACTOR:	PROJECT DIRECTOR
Horizions Incorporated Cleveland, Ohio 44104	Selwyn H. Rose, Head Inorganic Chemistry Dept.

Project Site: Cleveland, Ohio

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 12, 1970	Project Cost:	$88,008.00
Completion Date:	June 11, 1971	Federal Cost:	$88,008.00

DESCRIPTION OF PROJECT

It was suggested in a previous project that continuous foam fractionation has great potential for the removal of metal ions from mine drainage. It is proposed to carry out an in depth study of continuous foam fractionation aimed toward a practical understanding of the variables necessary for future pilot plant operation. This project will be concerned with the construction of a continuous flow fractionation system designed to empirically optimize the independent variables controlling separation, which are:

1. Concentration ratio of surfactant to contaminants.
2. Column design, which includes column diameter, column height and structural modification for study of four modes of continuous operation.
3. Bubble Diameter.
4. Liquid flow rate, which includes mine water and surfactant flow.
5. Gas flow rate.
6. Foam drainage time.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 FWW

TITLE OF PROJECT: "Trough Creek Limestone Barrier Installation and Evaluation"

GRANTEE:
Commonwealth of Pennsylvania
Dept. of Mines & Mineral Ind.
660 Boas Street
Harrisburg, Pennsylvania 17102
Africa Engineering Assoc. Inc.
Project Site: Trough Creek, Pennsylvania

PROJECT DIRECTOR:
Dr. David R. Maneval
Director of Research
and Development

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 22, 1970	Project Cost:	$233,460.00
Completion Date:	January 22, 1973	Federal Cost:	$28,160.00

DESCRIPTION OF PROJECT

The Commonwealth of Pennsylvania, Department of Mines and Mineral Industries will construct limestone barriers at six locations in the Trough Creek Watershed for the purpose of eliminating mine drainage pollution of Trough Creek. As a part of constructing these barriers, an investigation and evaluation of the effectiveness of the barriers will be undertaken. This will include: analysis of selected samples of limestone that will be tagged and placed within the barriers; chemical analysis of the stream and flow gauging; and evaluation of hydraulic design and recommendation for improvement.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.
WASHINGTON D. C. 20242

WPCHQ-9200-1
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14010 FZU

TITLE OF PROJECT: "An Analysis of the Legal Problems in Reclamation of Mines in Appalachia"

GRANTEE:

University of Maryland School
of Law
500 West Baltimore Street
Baltimore, Maryland 21201

PROJECT DIRECTOR:

Mr. Everett F. Goldbert
Mr. Garrett Power

Project Site: Baltimore, Maryland

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 29, 1970

Project Cost: $44,523.00

Completion Date: September 30, 1971

Federal Cost: $42,247.00

DESCRIPTION OF PROJECT

The purpose of this project is to study the legal obstacles inhibiting reclamation of mine land in Appalachia and to recommend legal reforms which will facilitate reclamation. This entails the following steps:

1. A study of the patterns of ownership of surface and mineral rights in the area concerned and an approval of the extent to which mined land has been abandoned.
2. A study of the existing governmental authority to enter upon and reclaim land which has been mined, including an appraisal of the degree to which existing laws provide effective reclamation powers.
3. A study of the existing authority to maintain without further degradation land which has been reclaimed.
4. An evaluation of alternative legal mechanisms which might give governments more effective power to accomplish reclamation and to maintain reclaimed land.
5. Recommendations as to the preferred mechanism for optimizing the ability of state and local governments to engage in reclamation and to maintain reclaimed land. Draft legislation will be prepared to implement these recommendations.

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OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
DEPARTMENT OF THE INTERIOR,
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Address inquiries to the attention of Project Coordination

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14020 EHW

TITLE OF PROJECT: "North Fork Alluvial Decontamination Project"

GRANTEE:	PROJECT DIRECTOR:
West Central Texas Municipal Water District Box 2362 Abilene, Texas 79604	Austin P. Hancock General Manager

Project Site: Abilene, Texas

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	May 10, 1968	Project Cost:	$272,323.00
Completion Date:	May 9, 1971	Federal Cost:	$184,816.00

DESCRIPTION OF PROJECT

This project will demonstrate an actual clean-up of contaminated surface waters using the deep well disposal technique. Abatement of surface water pollution due to oil production brine waste seepage into streams from shallow alluvium will be accomplished by pumping the brine out of shallow aquifers and injecting it into deep saline aquifers for permanent disposal.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5, *Federal Water Pollution Control Act, As Amended.*

PROJECT NUMBER: 14020 FVW (14-12-873)

TITLE OF PROJECT: "Small Scale Chloride Waste Treatment"

CONTRACTOR:	PROJECT DIRECTOR
University of Oklahoma Research Institute Norman, Oklahoma 73069	Professor George W. Reid

Project Site: Norman, Oklahoma

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 24, 1970	Project Cost:	$29,835.00
Completion Date:	June 23, 1971	Federal Cost:	$29,835.00

DESCRIPTION OF PROJECT

The project will investigate and evaluate methods of brine control applicable to small localized oil production, select applicable design criteria, and prepare a manual entitled, "Brine Control for Small Scale Operators." Emphasis will be on water pollution aspects detailing the various procedures which may be available to minimize or prevent water pollution, as well as areas requiring additional study.

Specifically the objectives of the project are economic, technical and institutional (legal) appraisal of disposal techniques available to the small operator. Selection of promising design criteria and specifications will be based on (a) transportation, (b) injection, (c) solar evaporation, and (d) desalination. Likelihood of system failure and procedural techniques will be considered.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

WPCHQ-9200-2
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14030 EDB

TITLE OF PROJECT: "Evaluation of Potential Water Pollution from Spent and/or Burned Oil Shale Residues"

GRANTEE:	PROJECT DIRECTOR:
Colorado State University Fort Collins, Colorado	Dr. John C. Ward Dept. of Civil Engineering

Project Site: Fort Collins, Colorado

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 13, 1969	Project Cost:	$40,557.00
Completion Date:	December 12, 1970	Federal Cost:	$38,504.00

DESCRIPTION OF PROJECT

The project is to determine the potential water pollution that would result from water erosion of spent and burned oil shale residue. The porosity, permeability, particle size distribution, quality (chemical and physical) and quantity of aqueous extracts of the residue from the retorting methods considered most economically feasible, at the present time, will be determined. Leachability of the spent shale and water runoff studies (rainfall simulation experiments) will be included and the statistical correlation of all these factors (porosity, permeability, etc.) will then be compiled and evaluated.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

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(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14040 FKX

TITLE OF PROJECT: "Removal of Dissolved Contaminants from Mine Drainage"

GRANTEE:	PROJECT DIRECTOR:
University of Utah Salt Lake City, Utah 84112	Dr. M. C. Fuerstenau Dept. of Metallurgy 200 Mines Building

Project Site: Salt Lake City, Utah

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	May 14, 1970	Project Cost:	$21,351.00
Completion Date:	May 31, 1971	Federal Cost:	$20,246.00

DESCRIPTION OF PROJECT

This project will attempt to demonstrate that undesirable metal contaminants in mine drainage effluents may be absorbed on siliceous mill tailings which are generally available near the mine site. Experiments will be conducted in single element systems with selective types of mill tailings to determine absorption efficiency and capacity. Elements to be studied are: iron, aluminum, copper, lead, and maganese. Absorptive experiments will also be conducted with actual mine drainage at the mine sites. Experimental conditions established from laboratory tests on single elements systems will be used.

Metal ion removal from tailings loaded in the previous described manner will be studied as a function of volume of water and pH. In addition, experiments will also be conducted by contacting the loaded tailings with water for a period of time and cycling through air drying.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14040 FVD

TITLE OF PROJECT: "Storage and Disposal of Wastes Resulting from the Concentration of Low Grade Iron Ore"

GRANTEE:

Michigan Technological Univ.
Houghton, Michigan 49931

PROJECT DIRECTOR:

Dr. G. R. Alger
Civil Engineering Dept.

Project Site: Houghton, Michigan

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	May 15, 1970	Project Cost:	$73,603.00
Completion Date:	September 15, 1971	Federal Cost:	$45,603.00

DESCRIPTION OF PROJECT

The overall objective of the proposed project is to improve the applied technology related to the storage, disposal, and reuse of water resulting from the beneficiation of low grade iron ore, and specifically:

(1) To develop basin design and management criteria which recognize the influence of tailings settleability as well as the effects of hydrologic phenomena on pond effluent quality.

(2) To investigate the physical and transport characteristics of the supra-colloidal particles contained in the tailings basin discharge with a view toward predicting the rate at which these particles might be removed from a natural water system.

(3) To investigate alternative tertiary treatment methods for eliminating the fine particulate materials from the basin discharge with a view toward developing a tertiary treatment system for subsequent demonstrations.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
DEPARTMENT OF THE INTERIOR.
WASHINGTON D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14040 FZC

TITLE OF PROJECT: "Abatement of Mine Drainage Pollution from Mines of the Rocky Mountains"

GRANTEE:	**PROJECT DIRECTOR:**
Colorado Seminary University of Denver University Park Denver, Colorado 80210	Dr. L. W. Ross Department of Chemical Engineering

Project Site: Denver, Colorado

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 10, 1970	**Project Cost:**	$22,465.00
Completion Date:	June 9, 1971	**Federal Cost:**	$21,340.00

DESCRIPTION OF PROJECT

This project is to study the abatement of acid mine drainage originating from metal (hard rock) mining in the Rocky Mountains. Techniques developed in the Applachia regions and those necessary to remove those metals unique to this region will be investigated. These metal ions would be precipitated by an alkaline sulfide added to the stream after pH adjustment. Emphasis will be placed on economic considerations including treatment costs and possible marketability of the metal sludges.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

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INFORMATION SHEET

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 14050 EPU

TITLE OF PROJECT: "Utilization of Phosphate Slimes"

GRANTEE:	PROJECT DIRECTOR:
International Minerals Corp. 5401 Old Orchard Rd. Skokie, Illinois 60076	Srini Vasan International Minerals Corporation

Project Site: Chicago, Ill. and Lakeland, Fla.

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	October 1, 1969	Project Cost:	$219,792.00
Completion Date	December 31, 1970	Federal Cost:	$153,854.00

DESCRIPTION OF PROJECT

The project will attempt to prepare a commercially competive product (brick, tile, etc.) from waste slimes which are generated by the processing of phosphate ores in Central Florida. Preliminary tests have shown that clay-type bodies can be made from slimes using standard kiln techniques. Progress to date indicates several clay products can be produced. Further investigation will be to determine the optimum economics.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.

WASHINGTON D. C. 20242

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INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15010 DSZ

TITLE OF PROJECT: "Pollution Control of Bathing Beaches by Use of a Pneumatic Curtain"

GRANTEE OR CONTRACTOR:

National Pollution Control
Foundation
866 U. N. Plaza, Room 423
New York, New York 10017

PROJECT DIRECTOR:

Dr. Raymond J. Moshy
Staff V.P. & Director-Research
American Machine & Foundry Co.
869 Hope
Springdale, Connecticut

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $265,584.00

Obligation Date: May 6, 1968

Total Federal Cost: $197,463.00

Completion Date: October 1969

FINAL REPORT:

TITLE: POLLUTION CONTROL OF BATHING BEACHES BY USE OF A PNEUMATIC CURTAIN (15010 DSZ 10/69)

Abstract:

This project was to determine the feasibility of reducing water pollution in tidal beach areas by using aeration/chlorination systems.

The aeration did not exhibit any appreciable reduction in pollution. The chlorination, as expected, reduced the pollution. However, the chlorine demand of the bottom deposits, and the chlorine removal by the changing tides, indicated the costs would be excessive.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5 Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15020 DGR

TITLE OF PROJECT: "Treatment of Boat Wastes"

CONTRACTOR:
Uniroyal, Inc.
Research Center
Wayne, New Jersey

PROJECT DIRECTOR
M.W. Olson,
Senior Research Eng.
Uniroyal, Inc.

Project Site: Wayne, New Jersey

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	Feb. 27, 1969	**Project Cost:**	$34,122
Completion Date:	April 27, 1970	**Federal Cost:**	$34,122

DESCRIPTION OF PROJECT

This project will consist of two phases, Phases I and II will be a feasibility and demonstration study for the use of flexible systems for waste storage on small watercraft.

Phase I: 1) The available space on a variety of small watercraft for locating a flexible waste collection system will be charted.
2) The economic feasibility and complexity of installing waste storage systems on watercraft will be examined.
3) A technical literature search will be conducted into methods used for filtering waste bearing solutions and other treatment opeational details.

Phase II: 1) A mock-up of a boat section will be built that involves waste generating devices and space for a collection container
2) The most promising collection system will be fabricated
3) The system will be operated for demonstrating its effectiveness.

STATUS as of 8/1/70: Final Report Being Prepared

FWQA Project Officer: Ernest G. Karvelis, Edison Water Quality Lab.,
Edison, New Jersey . 08817

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5 Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15020 DHB

TITLE OF PROJECT: "Storage of Wastes from Watercraft and Disposal at Shore Facilities"

CONTRACTOR:
General Dynamics
Elec. Boat Div.
Eastern Point Road
Groton, Connecticut 06340

PROJECT DIRECTOR
M. H. Wallman, Chief
Environmental Science
General Dynamics

Project Site: Groton, Conn.

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	3-14-69	**Project Cost:**	$32,569
Completion Date:	1-13-70	**Federal Cost:**	$32,569

DESCRIPTION OF PROJECT

A waste impoundment system will be designed and constructed for use onboard an Electric Boat tug, The Three Duces. The design will minimize the waste water volume from the galley, and compact the wastes from all sources to be stored for shore disposal. For odor control the tank vent will contain an activated carbon canister.

Disposal of wastes will be demonstrated at a shore facility. Disposal techniques will include pumping the wastes to a dock side sewer connection, to a small dock side treatment plant, or to a commerical septic tank truck.

Project Officer:
Ernest G. Karvelis
Edison Water Quality Lab,
Edison, New Jersey 08817

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

WPCHQ-9200-2
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INFORMATION SHEET

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5 Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15020 DHE

TITLE OF PROJECT: "Treatment of Watercraft Wastes from Small Vessels to Shore Treatment Facilities"

CONTRACTOR:

Underwater Storage, Inc.
Silver Schwartz, Ltd., Joint Venture
1028 Connecticut Avenue, N.W.
Washington, D.C. 20036

Project Site:
Washington, D.C.

PROJECT DIRECTOR

H. C. John Russell
Project Manager
Underwater Storage, Inc.

SPECIFIC DATA ABOUT THIS AWARD

Award Date: February 12, 1969

Completion Date: September 2, 1969

Project Cost: $99,200

Federal Cost: $99,200

DESCRIPTION OF PROJECT

A technique will be demonstrated of reducing watercraft pollution by installing a holding device aboard small vessels and disposing of these wastes at the shore. Ten small vessels will be modified and equipped with holding devices. The wastes generated aboard each vessel will be kept in the holding tanks and disposed at a marina along the Anacostia River by pumping the wastes into a collection line. The amount of wastes that has entered the collection line will be metered and then stored in an underwater nylon storage tank. Septic tank trucks will remove the wastes from the underwater storage tank at least once a week.

Final report published: September 1969

FWQA Project Officer: Patrick Tobin, Edison Water Quality Laboratory, Edison, New Jersey 08817

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5 Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15020 DHG

TITLE OF PROJECT: "Treatment of Watercraft Wastes"

CONTRACTOR: General Elec. Co.
3198 Chestnut St.
Philadelphia, Pa.

PROJECT DIRECTOR James C. White
General Elec. Co.

Project Site: Philadelphia, Pa.

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	4-30-69	**Project Cost**:	$226,206
Completion Date:	3-31-71	**Federal Cost**:	$226,206

DESCRIPTION OF PROJECT

The program shall consist of two phases. Phase I shall completely characterize sanitary, culinary, and wash water wastes by collecting existing information, i.e., field visits and sampling aboard vessels. Phase II consists of constructing and installing an actual operating system, and a subsequent study of salinity effects, floatable residues, hydrogen gas generation, electrode optimization, vacuum collection, grinding, holding, settling, and disinfection using this installed system. The major emphasis of this program shall be devoted toward optimization and development of the electrocoagulation portion of the overall system.

Project Officer: Kurt Jakobson
Washington, D.C.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 15020 ENN

TITLE OF PROJECT: "Control of Pollution from Outboard Engine Exhaust"

GRANTEE:

Rensselaer Polytechnic Institute
Troy, New York 12181

PROJECT DIRECTOR:

William W. Shuster
Div. of Bio-Environmental Eng.
Rensselaer Polytechnic Inst.
Troy, New York 12181

Project Site: Troy, New York

SPECIFIC DATA ABOUT THIS AWARD

Award Date: March 10, 1970

Project Cost: $27,562

Completion Date: June 30, 1970

Federal Cost: $26,104

DESCRIPTION OF PROJECT

In this project, it is proposed to investigate the effectiveness of a pollution control device in alleviating the impact of exhaust products from two-cycle outboard engines on natural water. This will involve the determination of output and distribution of two-cycle outboard engines exhaust products, its effect on water quality and the potential impact on the biological community in particular primary productivity.

The first phase will be studied in an enclosed tank of about 15 feet in diameter with maximum depth of 6 feet to provide a reasonable surface to volume ratio. Carbon balances will be made to determine the distribution of fuel in the air, in the surfaces of the water and tanks, and in the bulk of the water in the tanks, and in the bulk of the water in the tanks. The effect of incorporating lake muds into the system will be studied since sorption phenomena may be significant in terms of immediate removal and perhaps subsequent leaching.

STATUS: Final Report being prepared by Grantee.

Project Officer: Patrick M. Tobin, Edison, N.J. 08817

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, *Federal Water Pollution Control Act, As Amended*

PROJECT NUMBER: 15030 DTL

TITLE OF PROJECT: "Community Action Guide for Erosion and Sedimentation Control"

GRANTEE:

National Association of Counties
Research Foundation
1001 Connecticut Ave. N.W.
Washington, D. C. 20036

PROJECT DIRECTOR:

Mel D. Powell, Director
of Contract Research

Project Site: Washington, D. C.

SPECIFIC DATA ABOUT THIS AWARD

Award Date: February 11, 1969

Project Cost: $56,543.00

Completion Date: March 15, 1970

Federal Cost: $41,343.00

DESCRIPTION OF PROJECT

An objective of the project is to prepare an action guide for soil erosion and sedimentation control which will assist local community officials, "Community Action Guide book for Soil Erosion and Sedimentation Control" (15030 DTL 3/70) is available from the Clearinghouse, Springfield, Virginia 22151 (191 765) $3.00.

In addition, a preliminary State-of-the-Art report on erosion and sedimentation control will be prepared. This will include information obtained in preparing the "Guide" and define Research and Development needs.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 15030 FMZ

TITLE OF PROJECT: "Demonstration & Quantitative Evaluation of Storm Water Erosion and Sediment Control Practices in a Developing Urban Area"

GRANTEE:	**PROJECT DIRECTOR:**
State of Maryland Dept. of Water Resources Annapolis, Maryland 21401	Mr. Marshall Augustine

Project Site: City of Columbia, Maryland

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 29, 1970	**Project Cost:** $432,000.00
Completion Date: June 28, 1972	**Federal Cost:** $280,000.00

DESCRIPTION OF PROJECT

The project consists of: (1) the implementation, demonstration and evaluation of erosion control practices; (2) the construction, operation, demonstration, and evaluation of the use of a local storm retention pond and treatment unit for the control of storm water pollution; (3) the construction, operation, and maintenance of methods for handling, drying, conditioning, and disposal of sediment. This demonstration project will be conducted in a 200 acre watershed in a section of the Village of Long Reach in the City of Columbia, concurrent with the urbanization of a presently rural area. The demonstration will extend into the post-development period to obtain information on the effects after re-stabilization of the area.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 15040 EJZ

TITLE OF PROJECT: "Management of Water Quality in Stratified Reservoirs"

GRANTEE:
The Regents of the University
of California
Water Resources Center
University of California
Los Angeles, California 90024
Project Site: Berkeley, California

PROJECT DIRECTOR:
Dr. H. B. Fischer, Asst. Prof.
Dept. of Civil Engineering
University of California
Berkeley, California 94720

SPECIFIC DATA ABOUT THIS AWARD

Award Date: September 2, 1969

Project Cost: $10,898.00

Completion Date: August 31, 1970

Federal Cost: $10,209.00

DESCRIPTION OF PROJECT

The project will study the effect of fluctuations in the rate of outflow, such as often occurs with variations of powerhouse loads on downstream agricultural demands. Methods will be sought to predict water quality parameters in the outflow water, particularly temperature and dissolved salts resulting from various conditions of stratification in the reservoir and variations of the rate of outflow.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 15040 FZY

TITLE OF PROJECT: "Mixing and Dispersion of Contaminants in Reservoirs"

GRANTEE:	PROJECT DIRECTOR:
The University of Texas Austin, Texas 78712	Dr. Frank D. Masch Associate Professor of Engineering

Project Site: Austin, Texas

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	September 12, 1967	Project Cost:	$28,536.00
Completion Date:	September 9, 1970	Federal Cost:	$25,942.00

DESCRIPTION OF PROJECT

This project is a general investigation of the dilution capabilities and flow patterns of impoundments. The project has provided information on the general behavior of impoundments which can be applied to uncontrollable pollutants and the self-polluting process associated with these artificial lakes.

This award is for the third and final year of a project originally obligated September 13, 1965. The total project cost including this award is $81,450.00 and the total Federal cost is $80,046.00.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 15080 DEO

TITLE OF PROJECT: "Demonstration of the Complete Conversion of Crankcase Waste Oil Into Useful Products-Without Producing-Pollutant Material"

GRANTEE:

National Oil Recovery Corporation
Hook & Constable Road
Bayonne, New Jersey 07002

PROJECT DIRECTOR:

Solfred Maizus
P.O. Box 338

Project Site: Bayonne, New Jersey

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	January 28, 1969	**Project Cost:**	$1,678,104
Completion Date:	February 1, 1970	**Federal Cost:**	$387,331

DESCRIPTION OF PROJECT

This grant will demonstrate a new simplified process requiring minimum capital equipment and suitable for package construction for installations near waste oil sources and markets, as well as near complete conversion efficiency to reusable oil products and substantial reduction of the pollution potential from re-refining operations themselves. In addition, the process produces no sludge which has to be disposed. The grantee purports to have developed a saleable product for every cut.
Final Report under review 7-1-70.
Project Officer: Richard Keppler, FWQA, Boston, Mass. Phone (617) 223-3477.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6(b) *Federal Water Pollution Control Act,* *As Amended.*

PROJECT NUMBER: 15080 DJM

TITLE OF PROJECT: "Investigation of Recovery of Large Marine Oil Spills By Use of a Vortex Assisted Air Lift System"

CONTRACTOR:	PROJECT DIRECTOR
Battelle Memorial Institute Pacific Northwest Laboratories Richland, Washington	Paul C. Walkup

Project Site: Richland, Washington

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	April 28, 1969	Project Cost:	$29,840
Completion Date:		Federal Cost:	$29,840

DESCRIPTION OF PROJECT

Delineate an optimum system which utilizes a vortex generator and a high capacity air lift system eith an adjustable suction nozzle for pickup of spilled oil from the water surface. Performance of the system will be evaluated by prototype tests under simulated at-sea conditions.

Project Officer: Gerrald Willman, FWQA, Portland, Oregon.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section
Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 DJN

TITLE OF PROJECT: "In-Tank Gellation to Reduce Oil Loss From Tankers"

CONTRACTOR: Western Co.
2201 Waterview Pkwy.
Richardson, Texas

PROJECT DIRECTOR Jerry L. Overfield
(214) AD 1-3431

Project Site: Richardson, Texas

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	2-20-69	**Project Cost:**	$230,674
Completion Date:	20 months	**Federal Cost:**	$230,674

DESCRIPTION OF PROJECT

Development of a system to rapidly gel oil within a tanker compartment to reduce oil pollution incidents caused by leaking tamkers. The systems to be considered will be desinged for on-board and portable facilities to be transported to the point of use by watercraft or large helicopter.

Project Officer· George Putnicki
FWQA
Dallas, Texas

INQURIES: · Contacat the
Oil & Hazardous Materials Research Unit
Federal Water Quality Administration
Edison, New Jersey 08817 Phone: (201) 548-3347
OR
FWQA Project Officer

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

WPCHQ-9200-2
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6 *Federal Water Pollution Control Act, As Amended.*

PROJECT NUMBER: 15080 DJO

TITLE OF PROJECT: "Oil Tagging System Study"

CONTRACTOR:	**PROJECT DIRECTOR**
Melpar Incorporated 7700 Arlington Blvd. Falls Church, Virginia 22046	Dr. Thomas Meloy

Project Site: Arlington, Virginia

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	February 28, 1969	**Project Cost:**	$50,000
Completion Date:		**Federal Cost:**	$50,000

DESCRIPTION OF PROJECT

Determine an operation system(s) for tagging petroleum and petroleum products to be shipped in watercraft and seagoing vessels, to facilitate tracing the source of spilled oil. The study will include consideration of the feasibility of utilizing the following identification methods:

a. Chemical tags
b. Radiochemical tags
c. Passive chemical/physical analytical techniques
d. Particle tags

Project Officer: Ralph Rhodes, Washington, D.C. 20242. Phone (703) 557-7396.
Final report available.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6
Federal Water Pollution Control *Act*, *As* Amended

PROJECT NUMBER: 15080 DJP

TITLE OF PROJECT: "Oil-Water Separation System for Treatment of Oil Wastes"

GRANTEE:	**PROJECT DIRECTOR:**
Garrett Corporation Airesearch Manufacturing Company Los Angeles, California 90009	Dr. John L. Mason (213) 778-1010

Project Site: LosAngeles, California

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	April 18, 1969	**Project Cost:**	$197,098
Completion Date:	July, 1970	**Federal Cost:**	$197,098

DESCRIPTION OF PROJECT

The project will demonstrate the effectiveness of a high capacity, high efficiency centrifuge to separate oil-water mixtures collected by devices used to collect spilled oil from the water surface. The centrifuge will be tested under conditions simulating those encountered in an oil spill cleanup operation at sea.
Project Officer: Gerald Stern, 4255 Corona Drive, Los Angeles, Calif., 90032. Phone (213) 221-1012.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6
Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 DJQ

TITLE OF PROJECT: "Treatment of Oil Wastes Through the Use of Emulsifying Agents"

CONTRACTOR:	**PROJECT DIRECTOR**
Sonics International Inc. 7101 Carpenter Freeway P.O. Box 47088 Dallas, Texas 75247	Mr. C. B. Easley Phone (214) ME 1- 5402

Project Site: Dallas, Texas

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 13, 1969	**Project Cost:**	$43,058
Completion Date:		**Federal Cost:**	$43,058

DESCRIPTION OF PROJECT

The project will determine the feasibility of transporting oil in the form of a highly viscous emulsion created by utilizing ultrasonic techniques and certain additives. The high resistance to flow to be created will reduce cargo loss in the event of an accident.
Project Officer: George Putnicki, Dallas, Texas. Phone (214) 749-3842.

Address Inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR, WASHINGTON, D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6(b)
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 15080DOZ

TITLE OF PROJECT: "Test and Evaluate Mechanical and Pneumatic Barriers to Contain Spilled Oil and Means for Removing the Contained Oil in Harbors and Adjacent Waters"

GRANTEE:
Maine Port Authority
40 Commercial Street
Portland, Maine 04111

PROJECT DIRECTOR:
Mr. Edward Langlois

Project Site: Portland, Maine

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	July 19, 1968	**Project Cost:**	$106,975
Completion Date:	July 15, 1970	**Federal Cost:**	70,525

DESCRIPTION OF PROJECT

This project will test and evaluate a plastic foam boom and a diffused air bubble barrier for containment of oil spillages in the Port area and then follow up the containment phase with the design, construction, and evaluation of an oil recovery device to remove the contained oil. Limited demonstration of currently available oil removal equipment are also planned in cooperation with equipment users and suppliers. The eighteen month study will consider not only the effectiveness and removal efficiencies of the techniques involved but will give emphasis to the economic and logistics involved in oil spillage protection and control.

Project Officer: Thomas A. Devine
Federal Water Quality Administration
New England Basins Office
204 Highland Avenue
Needham Heights, Massachusetts 02194

Final Report Under Review: July 1, 1970

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section
Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 DXE

TITLE OF PROJECT: "Feasibility Analysis of Incinerator Systems for Restoration of Oil-Contaminated Beaches"

CONTRACTOR: Aerojet General Corp.
Environmental Systems Div.
9200 East Flair Drive
El Monte, Calif. 91734

PROJECT DIRECTOR R. M. Roberts
(213) 334-6211

Project Site: El Monte, Calif.

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	6-30-69	**Project Cost:**	$35,551
Completion Date:	24 weeks	**Federal Cost:**	$35,551

DESCRIPTION OF PROJECT

Feasibility analysis of alternative combustion systems, capable of total removal of oil contamination from beach materials. The project will conclude with recommendation concerning the technical and economic feasibility of alternate processes. Engineering concept drawings will be prepared.

Project Officer: Gerald Burke
Federal Water Quality Administration
Alameda, Calif. (415) 834-3402

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 DZR

TITLE OF PROJECT: "A Preliminary Study of Oil Spill Damage in the Intertidal Regions of Santa Barbara and Ventura Counties, California"

CONTRACTOR: Univ. of Cal.
Santa Barbara
Dept. of Biological Sciences
Santa Barbara, Calif.

PROJECT DIRECTOR Dr. Micheal Neushul

Project Site: Santa Barbara, Calif.

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	2-28-69	**Project Cost:**	$7,200
Completion Date:	5 months	**Federal Cost:**	$7,200

DESCRIPTION OF PROJECT

Survey intertidal zones at ten stations previously surveyed and ten new stations to determine the extent of departure from normal in populations of plants and animals resulting from the Santa Barbara oil spill.

Project Officer: Charles M. Seeley
Federal Water Quality Administration
627 Central Avenue
Alameda, Calif. (415) 273-7166

Final report under review: 7-1-70

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6 Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 EAF

TITLE OF PROJECT: "Multi-Spectrum Scanning to Determine Oil Slick Fate"

CONTRACTOR: University of Mich.
Willow Run Branch
Ann Arbor, Michigan

PROJECT DIRECTOR Kenneth P. Burns

Project Site: Santa Barbara, Calif.

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 26, 1969

Project Cost: $16,235

Completion Date: 7 months

Federal Cost: $16,235

DESCRIPTION OF PROJECT

Determine the multi-spectral radiation characteristics of crude oil in the Santa Barbara Channel. This data will be used to develop remote sensing techniques for oil.slick detection.

Project Officer: Ralph Rhodes
Division of Applied Sceince & Technology
Washington, D. C. 20242 (703) 557-7396

Data being evaluated by U. S. Geological Survey: 7-1-70

Address Inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6
Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 EAG

TITLE OF PROJECT: "Documentation of Cleanup Experience Following the Oil Spill Disaster at Santa Barbara, Calif."

CONTRACTOR:	PROJECT DIRECTOR
Battelle Memorial Institute Pacific Northwest Laboratories Richmond, Washington	Ward H. Swift

Project Site: Santa Barbara, California

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	April 18, 1969	Project Cost:	$22,900
Completion Date:	3 months	Federal Cost:	$22,900

DESCRIPTION OF PROJECT

The purpose of the study is to document the causes and effects of the February 1969 oil spill in the Santa Barbara Channel and assess the effectiveness of measures tried to contain and cleanup the spilled oil. This twelve week study is supported jointly by the Federal Water Pollition Control Administration and the Coast Guard.
Final Report available.
Project Officer: John C. Merrell, Southwest Region, 760 Market Street, San Francisco, California 94102. (415) 537-6170.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6
Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 EAL

TITLE OF PROJECT: "Proposal to Study the Abundance and Composition of Deep and Shallow Water Macroplankton and Littoral Fish Population in and about the Santa Barbara Channel"

CONTRACTOR: **PROJECT DIRECTOR**

Universtiy of California, Santa B. Dr. A. W. Ebling
Department of Biological Sciences
Santa Barbara, California

Project Site: Santa Barbara, California

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 16, 1969 **Project Cost:** $17,300

Completion Date: 7 months **Federal Cost:** $17,300

DESCRIPTION OF PROJECT

Survey shallow and deep water plankton and shallow water benthic fish populations to determine abundance and composition in regions influenced by the February 1969 oil spill.

Determine the departure from normal conditions utilizing existing baseline data. Computer programs which relate species composition, diversity and abundance to environmental factors to environmental conditions will be used. Project Officer: Charles M. Seeley, 627Central Aveune, Alameda, California Phone (415) 834-3402.

Final Report Under Review: 7-1-70

Address inquiries to the attention of Project Coordinator,
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 EBZ

TITLE OF PROJECT: "Treatment of Waterfowl Trapped in Oil Polluted Waters"

CONTRACTOR:
Univ. of Calif.
San Diego
La Jolla
California 92037

PROJECT DIRECTOR
Lynn A. Griner
Department of Pathology
P.O. Box 551
San Diego, Calif. 9211

Project Site: San Diego, Calif.

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	6-30-69	**Project Cost:**	$30,709
Completion Date:	6 months	**Federal Cost:**	$30,709

DESCRIPTION OF PROJECT

Determine the factors contributing to the death of wildfowl which have become coated with oil.

Develop methods of removing oil form birds plumage and restoring feathers to their normal condition.

Determine methods of managing cleaned birds to minimize mortality during captivity.

Project Officer:
R. W. Clawson
1220 Pacific Ave. Bldg. 132
San Diego, Calif. 92132

Final report under review: 7-1-70

Address Inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 15080EHF

TITLE OF PROJECT: "Microbiological Seeding to Accelerate Degradation of Hydrocarbons"

GRANTEE:
Florida State Univ.
Department of Oceanography
Tallahassee, Florida 32306

PROJECT DIRECTOR: Mr. Carl H. Oppenheimer

FWQA PROJECT OFFICER: Edmund Lomansey
Southeast Region
1421 Peachtree St. N.E.
Suite 300
Atlanta, GA. 30309

Project Site: Tallahassee, Florida

SPECIFIC DATA ABOUT THIS AWARD

Award Date: April 11, 1969

Completion Date: April 11, 1971

Project Cost: $118,460

Federal Cost: $105,803

DESCRIPTION OF PROJECT

Techniques will be developed to accelerate the natural degradation process of oil in marine waters. Selected cultures of micoorganisma, nutrient material and additives to increase the oil surface area will be added to oil in the environment to increase the ratio of degradation by microbiological action.

INQUIRIES: Contact the
Oil & Hazardous Materials Research Unit
Federal Water Quality Administration
Edison, N.J. 08817

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6
Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 EHO

TITLE OF PROJECT: "State-of-the-Art Report on the Composition
Properties and User of Oil Dispersants"

CONTRACTOR: Melvin Z. Polickoff
24 Knoll Road
Tenafly, New Jersey

PROJECT DIRECTOR: same as contractor
(201) 568-0572,

Project Site: Edison, New Jersey

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	4-1969	**Project Cost:**	$1,000
Completion Date:	3 weeks	**Federal Cost:**	$1,000

DESCRIPTION OF PROJECT

Using information available trhough personal experience, literature search and interviews, prepare a written report which critically summarizes current knowledge on the following:

1. Chemical nature of dispersants
2. Physical and chemical properties of dispersants
3. Manufacturing processes
4. Uses of dispersants and procedures by which their effectiveness, especially for dispersion of oil on water may be evaluated.

Porject Officer: Dr. Thomas A. Murphy
Oil & Hazardous Materials Research Unit
Edison, New Jersey 08817 (201) 548-3347

INQUIRIES: Contact the
Oil & Hazardous Materials Research Unit
Federal Water Quality Administration
Edison, New Jersey 08817 Phone: (201) 548-3347
OR
FWQA Project Officer

Final Report Available:

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 15080 EHP

TITLE OF PROJECT: "Collection of Spilled Oil with the Aid of Foams"

GRANTEE:
City of Cleveland
601 Lakeside Avenue
Cleveland, Ohio 44114

PROJECT DIRECTOR:
Dr. Edward J. Martin
Director, Clean Water Task Force

FWQA PROJECT OFFICER:
Charles Resley
FWQA
Chicago, Ill.

Project Site: Cleveland, Ohio

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 23, 1969

Completion Date: June 23, 1970

Project Cost: $98,300

Federal Cost: $68,810

DESCRIPTION OF PROJECT

The project, to be directed by the City of Cleveland and performed in part by Horizons Incorporated, will develop a device to collect spilled oil from the Water surface. The device will include provisions for trapping the oil film in a foam, collection and destruction of the oily foam.

A basic study of potential uses of "tramp oil" collected from the Cuyahoga River will also be carried out.

INQUIRIES: Contact the

Oil & Hazardous Materials Research Unit
Federal Water Quality Administration
Edison, N. J. 08817

Address Inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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Release Date: 9-9-70

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CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 15080 EJ0

TITLE OF PROJECT: "Investigation of Surface Films - Chesapeake Bay Entrance"

GRANTEE:	PROJECT DIRECTOR:
Virginia Institute of Marine Science Gloucester Point, Virginia 23062	Dr. Wyman Harrison, Chairman Department of Oceanography Virginia Institute of Marine Science Gloucester Point, Virginia 23062

Project Site: Gloucester Point, Virginia

SPECIFIC DATA ABOUT THIS AWARD

Award Date: September 9, 1970	Project Cost: $75,464
Completion Date: October 31, 1970	Federal Cost: $59,307

DESCRIPTION OF PROJECT

The objective of the project is to determine the fate of oil spilled in marine and estuarine waters. The rate of physical, chemical and biological changes on the properties of three grades of oil will be investigated employing a series of planned, carefully controlled oil releases.

Data on oil slick movement will be recorded and used to refine a slick movement prediction equation developed during the first year of the project.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 15080 EMP

TITLE OF PROJECT: "Molecular Interactions at the Oil-Water Interface and Formation of Microemulsions"

GRANTEE:	**PROJECT DIRECTOR:**
Columbia University in the City of New York Box 20, Low Memorial Library N.Y., N.Y. 10027	Dr. D. O. Shah Lamont-Doherty Geological Laboratory Palesades, N.Y. 10964

Project Site: Palesades, N.Y.

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 1, 1969	**Project Cost:**	$30,357
Completion Date:	July 1, 1970	**Federal Cost:**	$28,816

DESCRIPTION OF PROJECT

Basic laboratory studies of factors influencing the effectiveness of dispersants which might be used for oil pollution control purposes. Final report under review.
Project Officer: Lawrence H. Keith, Southeast Water Laboratory, College Station Road, Athens, Georgia 30610. Phone (404) 546-2011.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6 Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 EOB

TITLE OF PROJECT: "Evaluation of Selected Earthmoving Equipment in Veach Restoration Operations"

CONTRACTOR:
URS Systems Corp.
1811 Trousdale Drive
Burlingame, Calif, 94010

PROJECT DIRECTOR
Myron B. Hawkins
(415) 349-5111

Project Site: Burlingame, Calif.

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	8-29-69	**Project Cost:**	$172,489
Completion Date:	10 months	**Federal Cost:**	$172,489

DESCRIPTION OF PROJECT

This project is aimed at evaluating the effectivness of selected pieces of earth moving equipment, amking appropriate minor modifications to improve efficiency, developing operating procedures and demonstrating the system on a contaminated beach.

Project Officer: Gerald Barke
FWQA
Alameda, Calif. (415) 834-3402

INQUIRIES: Contact the
Oil & Hazardous Materials Research Unit
Federal Water Quality Administration
Edison, New Jersey 08817 Phone: (201) 548-3347
OR
FWQA Project Officer

Final report under review: 7-1-70

Address inquiries to the attention of Project Coordination

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6(b) *Federal Water Pollution Control Act, As Amended.*

PROJECT NUMBER: 15080 EOT

TITLE OF PROJECT: "Application of Froth Flotation Separation to Beach Restoration"

CONTRACTOR:

Melpar Incorporated
7700 Arlington Boulevard
Falls Church, Virginia 22046

PROJECT DIRECTOR

Dr. Thomas P. Meloy

Project Site: Falls Church, Virginia

SPECIFIC DATA ABOUT THIS AWARD

Award Date: October 29, 1969

Project Cost:

Completion Date: April 29, 1971

Federal Cost: $304,169

DESCRIPTION OF PROJECT

Design, construct and demonstrate the operation of a 30 ton/hour capacity froth flotation plant adapted for use in separation oil from contaminated beach sand. The plant made up of commercially "off the shelf" components and will be readily assembled at the location of the cleanup operation.

Address Inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 15080 EPL

TITLE OF PROJECT: "The Spreading of Oil Films"

GRANTEE: N.Y. University
School of Engineering and Science
University Heights
Bronx, N.Y. 10453

PROJECT DIRECTOR: Dr. Henry C. Schwartzberg

FWQA PROJECT OFFICER: Lloyd Kahn
Edison, N.J. 08817

Project Site: Bronx, N.Y.

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 22, 1969

Project Cost: $27,000

Completion Date: August, 1970

Federal Cost: $25,716

DESCRIPTION OF PROJECT

Laboratory scale studies to determine and correlate the factors influencing the spreading of oil spilled at sea. The correlations will be aimed at predicting the rate and extent of the spread of oil films so that available resources can be used most effectively in combating pollution caused by oil spills.

INQUIRIES: Contact the
Oil & Hazardous Materials Research Unit
Federal Water Quality Administration
Edison, N.J. 08817

or
FWQA PROJECT OFFICER

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 15080 ESL

TITLE OF PROJECT: "Containment and Collection of Oil in Protected Waters"

GRANTEE: Massachusetts Institute
of Technology
77 Massachusetts Ave.
Cambridge, Mass. 02139

PROJECT DIRECTOR: Dr. David P. Hoult

FWQA PROJECT OFFICER: Dr. T.A. Murphy
FWQA
Edison, N.J. 08817

Project Site: Cambridge, Mass.

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	November 10, 1970	**Project Cost:**	$150,000
Completion Date:		**Federal Cost:**	$135,000

DESCRIPTION OF PROJECT

Model studies will be carried out to gain information needed to design oil spill containment and collection systems for use in harbors, estuaries and near shore coastal waters. Study topics will include:

1) The motion and spreading of oil slicks;
2) The configuration of a wind driven oil slick restrained by a boon in the presence of waves and currents:
3) The details of motion of a section of a boom and the fluid mechanics of the water and oil flow associated with this motion;
4) The ability of a boom to follow moving wave contours, and the relation of this motion to structural requirements;
5) The flow of water and oil in a channel utilized to collect and concentrate oil slicks.
6) The fluid mechanics of oil skimming devices.
7) Boom strength requirements in short chop and, a 6 month study to develop preliminary design information.

INQUIRIES: CONTACT the

Oil & Hazardous Materials Research Unit
Federal Water Quality Administration
Edison, N.J. 08817

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Address Inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6(b) *Federal Water Pollution Control Act.* As Amended.

PROJECT NUMBER: 15080 EUU

TITLE OF PROJECT: "Hydrocyclonic System for Separating Oil From Sea Water"

CONTRACTOR:	**PROJECT DIRECTOR**
American Precess Equipment Corporation 10826 Venice Boulevard Culver City, California 90230	Robert Rod

Project Site: Culver City, California

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	January 15, 1970	**Project Cost:**	$78,870
Completion Date:	7 months	**Federal Cost:**	$78,870

DESCRIPTION OF PROJECT

Design, construct and test an oil-water separator which employs a cyclone concept to separate un-emulsified oil-water mixtures. The project will be broken into two phases - laboratory evaluation of a 50 gpm unit, and field demonstration of a 1 MGD unit. Project Officer: Edmund Lomasney, Southeast Region, 1421 Peachtree Street N.E., Suite 300, Atlanta, Georgia 30309. Final report under review 7-1-70.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 EZK

TITLE OF PROJECT: "Voraxial Oil Separation System"

CONTRACTOR: Reynolds Submarine
Services Corp.
615 Southwest Second Ave.
Miami, Florida 33130

PROJECT DIRECTOR Arthur L. Markel

Project Site: Miami, Florida

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	11-5-69	**Project Cost:**	$88,982
Completion Date:	7 months	**Federal Cost:**	$88,982

DESCRIPTION OF PROJECT

Design, construct and test at pilot scale (50 gpm) high capacity oil-water separator device for separation of oil-water mixture collected by mechanical oil slick harvesting devices. Key features of the separator are high capacity with low power and space requirements.

The device is based on a pump-separator unit which imparts a swirling action in the discharging line as it pumps the oil-water mixture collected by a skimmer system. The swirling action causes the oil to concentrate at the centerline of the pipe where it is skimmed off by one or more pitot tubes. It is estimated that an 8 inch 2500 gpm unit will be able to produce a water stream with from 10 to 100 mg/1 oil and an oil stream within excess of 50% oil.

Project Officer: Edmund Lomasney
1421 Peachtree Street, N.E., Suite 300
Atlanta, Georgia

INQUIRIES: Contact the
Oil & Hazardous Materials Research Unit
Federal Water Quality Administration
Edison, New Jersey 08817 Phone: (201)548-3347
OR
FWQA Project Officer

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 FIG

TITLE OF PROJECT: "A Mobile Washing System for In Place Restoration of Beaches Contaminated by Oil"

CONTRACTOR: Ecological Research Corp.
Hanover, New Hampshire 03755

PROJECT DIRECTOR Dr. Robert C. Dean, Jr.
Ecological Research Corp.
Hanover, New Hampshire

Project Site: Hanover, New Hampshire

SPECIFIC DATA ABOUT THIS AWARD

Award Date: 3-20-70

Project Cost:

Completion Date: 10 months

Federal Cost: $41,382

DESCRIPTION OF PROJECT

Design and test a pilot scale system for cleaning oil contaminated beach sand. The system includes a jet washer and cyclones for oil-water-sand separation. The project is the first phase of a two phase program to develop a compact mobile sand cleaning plant capable of processing 100 ton/hr. of oil contaminated.

Project Officer: Richard Keppler
FWQA
Boston, Mass.

INQUIRIES: Contact Project Coordination
Office of Research and Development
Federal Water Quality Administration
U. S. Department of the Interior
Washington, D. C. 20242

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR, WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6b Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 15080 FMW

TITLE OF PROJECT: "Biological Recovery Following and Oil Spill"

GRANTEE: Woods Hole Oceanographic
Institute
Woods Hole, Mass. 02543

PROJECT DIRECTOR: Dr. Howard L. Sanders

FWQA PROJECT OFFICER: Dr. T.A. Murphy
FWQA
Edison, N.J. 08817

Project Site: Woods Hole, Mass.

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	Jan. 21, 1970	**Project Cost:**	$44,862
Completion Date:	Jan. 21, 1971	**Federal Cost:**	$31,404

DESCRIPTION OF PROJECT

Studies to be conducted will document the biological effects of a large spill of fuel oil in Buzzards Bay, Massachusetts. Patterns of recolonization and faunal change will be correlated with studies of the distribution, movement and fate of oil in the sediments.

INQUIRIES: Contact the

Oil & Hazardous Materials Research Unit
Federal Water Quality Administration
Edison, New Jersey 08817

Address Inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DFMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5 Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 15080 FOP

TITLE OF PROJECT: "Oil Pollution Detection by Microwave Radiometry"

GRANTEE:
Microwave Sensor Systems
8050 E. Florence Ave.
Downey, Calif. 90240

PROJECT DIRECTOR: J. C. Aukland

FWQA PROJECT OFFICER:
David Minard
FWQA
620 Central Ave.
Alameda, Calif.
94501

Project Site: Downey, California

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 27, 1970

Project Cost: $16,110

Completion Date: November 27, 1970

Federal Cost: $11,277

DESCRIPTION OF PROJECT

The project will demonstrate the application of microwave radiometry to the detection and measurement of thickness of oil slicks under visibility conditions which would limit visual observation and the effectiveness of other remote sensing techniques. A stationary monitor will be mounted at a location in a harbor subject to chronic oil pollution. Monitor output will be compared to data collected manually on slick type and thickness and interferring environmental conditions such as wave action and changes in surface temperature.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
DEPARTMENT OF THE INTERIOR,
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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6(b) *Federal Water Pollution Control Act, As Amended.*

PROJECT NUMBER: 15080 FOZ

TITLE OF PROJECT: "Study of Spillage of Hazardous Polluting Substances"

CONTRACTOR:
Battelle Mem. Inst.
Pacific Northwest Labs
P.O. Box 999
Richland, Washington

PROJECT DIRECTOR
W.H. Swift
Battelle Mem. Inst.
P.O. Box 999
Richland, Washington

Project Site: Richland, Washington

SPECIFIC DATA ABOUT THIS AWARD

Award Date: 5-12-70

Completion Date: 10-1-70

Project Cost:

Federal Cost: $50,000

DESCRIPTION OF PROJECT

A study to evaluate the causes, effects and existing methods of migating the effects of spills of hazardous polluting substances and a program to develop effective means for coping with these incidents.

Specific areas to be included in the study are:

Classification of hazardous substances, an analysis of potential for hazardous materials spills, evaluation of effectiveness of existing contingency plans, evaluation of restoration methods, application of existing technology to detection control and treatment and recommendations for programs to develop new technology.

Project Officer: Paul Heitzenrater, Washington, D.C.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 FTU

TITLE OF PROJECT: "Documentation of the Breton Sound Oil Pollution Incident"

CONTRACTOR:
Alpine Geophy. Ass. Inc
Oak Street
Norwood, New Jersey 07648

PROJECT DIRECTOR:
Julius Hirshman, Director
Facilities Mngt. Div.
Alpine Geophy. Ass. Inc
Norwood, New Jersey
07648

Project Site: Breton Sound, Louisiana

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	3-29-70	**Project Cost:**	
Completion Date:	6-20-70	**Federal Cost:**	$24,500

DESCRIPTION OF PROJECT

The purpose of the study is to document effects of the March 1970, oil spill in Breton Sound, Gulf of Mexico, and assess the effectiveness of measures tried to contain and cleanup the spilled oil. Information is to be gathered at the site by first-hand observation, interviews and collection and correlation of data generated by key participants and observation on the scene.

Project Officer: George Putnicki
Federal Water Quality Administration
Dallas, Texas

Address Inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

WPCHQ-9200-2
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6(b) Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 FVP

TITLE OF PROJECT: "Comprehensive Oil Spill Control Program for New York Harbor and Immediate Waters"

CONTRACTOR:	PROJECT DIRECTOR
Fire Department, City of New York Municipal Building New York, New York 10007	Joseph F. Connor, Assistant Chief Marine Division, Pier "A" North River New York, New York 10004

Project Site: New York, New York

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 30, 1970	Project Cost:	$518,415
Completion Date:	June 30, 1971	Federal Cost:	$324,452

DESCRIPTION OF PROJECT

The project will demonstrate a comprehensive full scale program for coping with oil spills. The project will involve:

1. A thorough inventory and determination of the sources, fate and movement of oil spills in and near a major sea port-the New York Harbor.
2. Design analysis and evaluation of state-of-the-art devices and techniques for oil spill control.
3. Procurement of equipment, development of spill response plans and the evaluation of their effectiveness on actual "spills of opportunity" in the New York Harbor area.

Project Officer: Howard Lamp'l
Edison Laboratory

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER Quality ADMINISTRATION DEPARTMENT OF THE INTERIOR, WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 FWL

TITLE OF PROJECT: "The Development of a Submerged Hydrodynamic Oil Contractor for the Recovery of Floating Oil"

CONTRACTOR:
JBF Scientific Corp.
Alpha Industrial Park
Chelmsford, Mass. 01824

PROJECT DIRECTOR
Ralph A. Bianchi
JBF Scientific Corp.
Alpha Industrial Park
Chelmsford, Mass. 01824

Project Site: Chelmsford, Mass.

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 30, 1970

Completion Date: June 30, 1971

Project Cost:

Federal Cost: $145,000

DESCRIPTION OF PROJECT

The project will involve the development and demonstration of a prototype scale mechanical harvesting device based upon a unique "submerged hydrodynamic oil concentractor".

The principle of the hydrodynamic oil concentrator involves forcing the surface oil to follow the submerged contour of an included plan so that the oil form is thickened. The thickened film is trapped in a well at the end of the included plane.

Project Officer:
Thomas Divine
Federal Water Quality Administration
New England Basin Officer
204 Highland Avenue
Heedham Heights, Mass 02194

WPCHQ-9200-2
(3-70)

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6(b), *Federal Water Pollution Control Act,* As Amended.

PROJECT NUMBER: 15080 FWM

TITLE OF PROJECT: "Concept for Recovery of Floating Oil"

CONTRACTOR:
Consultec, Inc.
2351 Research Boulevard
Rockville, Maryland 20850

Project Site: Rockville, Md.

PROJECT DIRECTOR
R. B. Dayton, Director
Engineering Division
Consultec, Inc.
2351 Research Boulevard
Rockville, Maryland 20850

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 8, 1970

Completion Date: October 8, 1970

Project Cost: $32,075

Federal Cost: $32,075

DESCRIPTION OF PROJECT

Concept development studies on a device to harvest oil slicks based upon the use of a water permeable-oil impermeable filter bag. Studies will be limited to the evaluation of various filter bag designs and filter medias.

Project Officer: Ralph Rhodes, FWQA Washington, D.C.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6(b)
Federal Water Pollution Control Act, *As Amended.*

PROJECT NUMBER: 15080 FWN

TITLE OF PROJECT: "Recovery of Floating Oil-Rotating Disk Type Skimmer"

CONTRACTOR:	PROJECT DIRECTOR
Atlantic Research Corporation Missile Systems Division Costa Mesa, California 92626	S. T. Uyeda Atlanta Research Corporation Missile Systems Division Costa Mesa, California 92626

Project Site: Costa Mesa, California

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 17, 1970	Project Cost: $69,548
Completion Date: 5 months	Federal Cost: $69,548

DESCRIPTION OF PROJECT

Concept development studies on a self contained oil harvesting device employing a series of rotating disks. Design variables to be investigated at model scale include disk material, shape, spacing, velocity of rotation and depth of immersion.
Project Officer: Gerald Stern, FWQA, Los Angeles, California.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

WPCHQ-9200-2
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5, Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 FWO

TITLE OF PROJECT:
Recovery of Floating Oil

CONTRACTOR:
New Mexico State University
Physical Science Laboratory
Box 3548
Las Cruces, New Mexico 88001

Project Site: Las Cruces, New Mexico

PROJECT DIRECTOR
H. R. Gleyre
New Mexico State University
Physical Science Laboratory
Box 3548
Las Cruces, New Mexico 88001

SPECIFIC DATA ABOUT THIS AWARD

Award Date:

Completion Date:

Project Cost: $157,058

Federal Cost: $157,058

DESCRIPTION OF PROJECT

Develop and demonstrate at 1/4 scale a mechanical oil recovery device which employs a combination of the principles, gravity weir, preferential wetting on a rotating belt and vacuum suction. The demonstration will be performed in a closed test basin equipped to simulate the environmental conditions expected in actual use.

Project Officer: Robert Hiller
Federal Water Quality Administration
1902 Elm Street
Dallas, Texas 75202

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER Quality CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6(b) Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 FWP

TITLE OF PROJECT: "Concept Development of a Hydraulic Skimmer System for Recovery of Floating Oil"

CONTRACTOR:	PROJECT DIRECTOR
Battelle Memorial Institute Pacific Northwest Laboratories P.O. **Box** 999 Richland, Washington 99352	Mr. P. C. Walkup (Same)

Project Site: Richland, Washington

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 17, 1970	Project Cost:	$86,035
Completion Date:	December 17, 1970	Federal Cost:	$86,035

DESCRIPTION OF PROJECT

Design fabrication and full-scale testing of an oil harvesting system employing water jet sweeps and floating, skimming and primary oil-water separation. Phase I, will be limited to design and fabrication of sub-assemblies and testing of one of the two units required per vessel in a closed basin.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER Quality CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

WPCHQ-9200-2
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 FXA

TITLE OF PROJECT: "Testing Oil Dispersant Toxicity and Emulsion Efficiency"

CONTRACTOR: Syracuse University Research Corp.
Life Sciences Division
Syracuse, New York 13210

PROJECT DIRECTOR Dr. Richard B. Moore

Project Site:

SPECIFIC DATA ABOUT THIS AWARD

Award Date: 6/24/70

Project Cost:

Completion Date: 10/24/70

Federal Cost: $15,023

DESCRIPTION OF PROJECT

The study will be one of four identical studies to determine reproducibility, cost and operational difficulties associated with tests developed by the Federal Water Quality Administration to measure oil dispersant toxicity acute toxicity effectiveness and BOD of four dispersants according to procedures supplied by Federal Water Quality Administration.

Project Officer: Thomas A. Murphy
Federal Water Quality Administration
Edison, New Jersey 08817

WPCHQ-9200-2
(3-70)

Address Inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR, WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5, *Federal Water Pollution Control Act, As Amended.*

PROJECT NUMBER: 15080 FXB

TITLE OF PROJECT:
"Testing Oil Dispersant Toxicity and Emulsion Efficiency"

CONTRACTOR:
New England Aquarium
Central Wharf
Boston, Massachusetts 02110

PROJECT DIRECTOR
Dr. S. Fai Cheuk
New England Aquarium
Central Wharf
Boston, Massachusetts 02110

Project Site: Boston, Massachusetts

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 25, 1970

Completion Date: October 25, 1970

Project Cost:

Federal Cost: $11,200

DESCRIPTION OF PROJECT

The study will be one of four identical studies to determine reproducibility, cost and operational difficulties associated with tests developed by the FWQA to measure oil dispersant toxicity and efficiency. Each Contractor will measure comparative acute toxicity effectiveness and BOD dispersants according to procedures supplied by FWQA.

Project Officer: Dr. Thomas A. Murphy
Federal Water Quality Administration
Edison, New Jersey

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

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INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6(b) Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 FXC

TITLE OF PROJECT: Demonstration of New Procedure for In-Place Beach Restoration

CONTRACTOR:
Sonics International, Inc.
7101 Carpenter Freeway
Dallas, Texas 75247

PROJECT DIRECTOR
Mr. Byron Dunn, Vice President
Sonics International, Inc.
7101 Carpenter Freeway
Dallas, Texas 75247

Project Site: Burlingame, California

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 7, 1970

Project Cost: $33,988

Completion Date: June 13, 1970

Federal Cost: $20,004

DESCRIPTION OF PROJECT

To demonstrate and evaluate the use, effectiveness and cost of a device utilizing the ultrasonic energy concept to clean oil contaminated beach sands. Oily sand introduced into the device will be subjected to ultrasonic energy which will cause the oil to be seperated from the sand and float to a decanting chamber. Cleansed sand will settle and be returned to the beach.

Final report available:

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

WPCHQ-9200-2
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6(b)
Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 GAU

TITLE OF PROJECT:
"Testing Oil Dispersant Toxicity and Emulsion Efficiency"

CONTRACTOR:
University of Miami
School of Marine & Atmospheric Sciences
10 Rickenbacker Causeway
Miami, Florida 33149

Project Site:
Miami, Florida

PROJECT DIRECTOR
Dr. Charles E. Lane - Univ. of Miami
School of Marine & Atmospheric Sciences
10 Rickenbacker Causeway
Miami, Florida 33149

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 30, 1970

Completion Date: October 30, 1970

Project Cost:

Federal Cost: $10,007

DESCRIPTION OF PROJECT

The study will be one of four identical studies to determine reproducibility, cost and operational difficulties associated with tests developed by the Federal Water Quality Administration to measure oil dispersant toxicity and efficiency. Each Contractor will measure comparative acute toxicity effectiveness and BOD of four dispersants according to procedures supplied by FWQA.

Project Officer: Dr. Thomas A. Murphy
Federal Water Quality Administration
Edison, New Jersey

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

WPCHQ-9200-2
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5, *Federal Water Pollution Control Act, As Amended.*

PROJECT NUMBER: 15080 GAV

TITLE OF PROJECT:
"Testing Oil Dispersant Toxicity and Emulsion Efficiency"

CONTRACTOR:
Pacific Engineering Laboratory
657 Howard Street
San Francisco, California 94105

PROJECT DIRECTOR
Robert A. Ryder, Director
Pacific Engineering Laboratory
657 Howard Street
San Francisco, California 94105

Project Site:
San Francisco, California

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 17, 1970

Project Cost:

Completion Date: October 17, 1970

Federal Cost: $16,830

DESCRIPTION OF PROJECT

The study will be one of four identical studies to determine reproducibility, cost and operational difficulties associated with tests developed by the Federal Water Quality Administration to measure oil dispersant toxicity and efficiency. Each Contractor will measure comparative acute toxicity effectiveness and BOD of four dispersants according to procedures supplied by FWQA.

Project Officer: Dr. Thomas Murphy, FWQA, Edison, N.J.

WPCHQ-9200-2
(3-70)

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

Address inquiries to the attention of Project Coordination

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section
Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15080 GBJ

TITLE OF PROJECT: "Development of A Concept for a Balt-Type Skimming Device for Recovering Floating Oil From Water Surface"

CONTRACTOR:
Rex Chainbelt, Inc.
4701 West Greenfield Ave.
West Milwaukee, Wisconsin 53214

PROJECT DIRECTOR
John Pernusch
Rex Chainbelt, Inc.
4701 W. Greenfield Ave
W. Milwaukee, Wis.
53214

Project Site: West Milwaukee, Wisconsin

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	6/25/70	**Project Cost:**	
Completion Date:	2/25/70	**Federal Cost:**	$179,623

DESCRIPTION OF PROJECT

Develop fundamental design criteria for a belt-type oil harvesting device, design and test a prototype device.

The project will include the following major tasks:

1. Engineering design of a belt-type harvesting device. In this phase special emphasis will be devoted to belt materials and belt assembly configurations.
2. Fabrication of an experimental prototype.
3. Testing under simulated environmental conditions.
4. Evaluation of test results.

Project Officer: Ralph Rhodes
Federal Water Quality Administration
Washington, D. C. 20242.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 6(b)
Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 15090 FOZ

TITLE OF PROJECT: "Study of Spillage of Hazardous Polluting Substances"

CONTRACTOR:
Battelle Memorial Institute
Pacific Northwest Laboratories
P.O. Box 999
Richland, Washington

PROJECT DIRECTOR
W. H. Swift
Battelle Memorial Institute
P. O. Box 999
Richland, Washington

Project Site: Richland, Washington

SPECIFIC DATA ABOUT THIS AWARD

Award Date: 5-12-70

Completion Date: 10-1-70

Project Cost:

Federal Cost: $60,000

DESCRIPTION OF PROJECT

A study to evaluate the causes, effects and existing methods of migating the effects of spills of hazardous polluting substances and a program to develop effective means for coping with these incidents.

Specific areas to be included in the study are:

Classification of hazardous substances, an analysis of potential for hazardous materials spills, evaluation of effectiveness of existing contingency plans, evaluation of restoration methods, application of existing technology to detection control and treatment, recommendations for programs to develop new technology and background information on the technical aspects of administration and enforcement of water quality statutes pertinent to the problems of spillage of hazardous polluting substances.

Project Officer: Paul Heitzenrater, Washington, D. C.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 16090 --- (WP-01090)

TITLE OF PROJECT: "Data Collection Economics for Water Pollution Studies"

GRANTEE OR CONTRACTOR:	PROJECT DIRECTOR:
Northeastern University Dept. of Civil Engineering Boston, Massachusetts 02115	Dr. Alvin S. Goodman

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $40,702.00	Obligation Date: March 31, 1967
Total Federal Cost: $24,162.00	Completion Date: July 1969

FINAL REPORT:

TITLE: USE OF MATHEMATICAL MODELS IN WATER QUALITY CONTROL STUDIES (16090 --- 7/69)

Abstract:

Mathematical models were utilized to study water pollution control programs in a river basin. Sensitivity analyses, with a steady state model, showed substantial variation of cost for sewage treatment, depending upon streams purification parameter selections.

An unsteady state model was developed to trace a time profile at any specified station in terms of flow and quality as BOD, dissolved oxygen, coliforms, and chlorides while upstream discharge, water temperature, and solar radiation vary.

The time varying model was used to investigate the effectiveness of an assumed configuration of treatment plants when the streams assimilative capacity varies with distance and time. Sensity analyses of stream parameters were also made with the time varying model.

Copies available from the Clearinghouse, Springfield, Virginia 22151 (188 494)

A(HQ)-9200-3 (4-70)

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 DAJ

TITLE OF PROJECT: "Allocation of Stream Pollution Carrying Capacity"

GRANTEE:
Syracuse University Research Institute
201 Marshall Street
Syracuse, New York 13210

PROJECT DIRECTOR:
Dr. Nelson L. Nemerow
Professor of Civil Engineering
151 Hinds Hall

Project Site: Syracuse, New York

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 12, 1969	Project Cost:	$27,215.00
Completion Date:	August 31, 1970	Federal Cost:	$25,665.00

DESCRIPTION OF PROJECT

The project has developed a "pollution index" for numerically ranking water quality conditions in streams where different pollutants are present. A procedure for quantifying economic benefits resulting from different levels of water quality in a multiple use watercourse was also developed.

The final phase of the project will attempt to determine whether the limited pollution carrying capacity of the Nation's streams should be regualted solely on a legislative basis, or whether they can also be allocated reasonably on an economic basis in conjunction with Federal and State laws.

This award is for the second and final year of a project originally obligated March 7, 1967. The total project cost including this award is $84,530.00 and the total Federal cost is $75,544.00.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5, *Federal Water Pollution Control Act, As Amended.*

PROJECT NUMBER: 16090 DBJ (14-12-476)

TITLE OF PROJECT: "Water Quality Surveillance Systems for Major River Basins"

CONTRACTOR:	PROJECT DIRECTOR
Cyrus Wm. Rice & Co. 15 Noble Avenue Pittsburgh, Pennsylvania 15205	P. V. Morgan Vice President

Project Site: Pittsburgh, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date: December 6, 1968	Project Cost: $85,000.00
Completion Date: March 31, 1970	Federal Cost: $85,000.00

DESCRIPTION OF PROJECT

The project is to develop design criteria for establishing adequate and efficient water quality surveillance networks in major river basins as specified in the Water Quality Act of 1965. The criteria would include sampling station density, sampling frequency for specific pollutants, station location, and the need for various degrees of automation in sampling and data processing.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, *Federal Water Pollution Control Act, As Amended*

PROJECT NUMBER: 16090 DBX

TITLE OF PROJECT: "Evaluation of Dispersed Pollutional Load"

GRANTEE:	PROJECT DIRECTOR:
University of Oklahoma Norman, Oklahoma 73069	George W. Reid School of Civil Engineering

Project Site: Norman, Oklahoma

SPECIFIC DATA ABOUT THIS AWARD

Award Date: August 23, 1968
Project Cost: $20,515.00
Completion Date: March 31, 1970
Federal Cost: $8,212.00

DESCRIPTION OF PROJECT

The objective of the project is to develop a technique for evaluating the dispersed pollutional load (i.e. natural pollution, rural runoff, urban runoff). Data is being gathered from drainage basins within Metropolitan Tulsa to correlate pollution levels to land use practices. Mathematical equations will be developed for estimating the expected seasonal bacterial, organic, nutrient and solid concentrations from dispersed runoff.

This award is for the second year of a project originally obligated July 12, 1967. The total project cost including this award is $32,806 and the total Federal cost is $31,244.00.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR.
WASHINGTON D. C. 20242

INFORMATION SHEET

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 16090 DCL

TITLE OF PROJECT: "Delaware Estuary and Bay Water Quality Sampling and Mathematical Modeling Project"

GRANTEE OR CONTRACTOR:	PROJECT DIRECTOR:
Delaware River Basin Comm. P. O. Box 360 Trenton, New Jersey 08603	James F. Wright Executive Director

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $126,666.00	Obligation Date: June 28, 1967
Total Federal Cost: $122,583.00	Completion Date: May 1970

FINAL REPORT:

TITLE: "Final Progress Report Delaware Estuary and Bay Water Quality Sampling and Mathematical Modeling Project" (16090 DCL 5/70)

Abstract: The report is an evaluation of data collected from a definitive sampling program to substantiate and improve mathematical modeling techniques and develop a base line for the Delaware Estuary and Bay water quality.

FWQA(HQ)-9200-3 (4-70)

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 16090 DEA

TITLE OF PROJECT: "Complementary-Competitive Aspects of Water Storage"

GRANTEE OR CONTRACTOR:	PROJECT DIRECTOR:
Sacramento State College 6000 Jay Street Sacramento, California 95819	Kenneth D. Kerri Associate Professor of Civil Engineering

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost:	$66,611.00	Obligation Date:	May 16, 1966
Total Federal Cost:	$62,122.00	Completion Date:	December 1969

FINAL REPORT:

TITLE: COMPLEMENTARY-COMPETITIVE ASPECTS OF WATER STORAGE (16090 DEA 12/69)

Abstract:

An analytical model has been developed that is capable of allocating water to competing demands on the basis of economic efficiency. The value of water is determined from the slopes of the benefit functions for water uses and an algorithm, based on the theory of marginal analysis, allocates water after considering the complementary and competitive uses of available water. Results predict the frequency and magnitude of shortages for each beneficial use water. The effectiveness of the analytical model was tested on the proposed Holley Reservoir in the Willamette Valley in Oregon.

Copies available from the Clearinghouse, Springfield, Virginia 22151 (190 197) $3.00.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

FWQA(HQ)-9200-3 (4-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 DHX

TITLE OF PROJECT: "Automated Forecast Procedures for River Quality Management"

GRANTEE:
Ohio River Valley Water Sanitation Commission
414 Walnut Street
Cincinnati, Ohio 45202

PROJECT DIRECTOR:
Robert J. Boes, P.E.
Chemical Engineer

Project Site: Cincinnati, Ohio

SPECIFIC DATA ABOUT THIS AWARD

Award Date: January 9, 1970

Project Cost: $135,000.00

Completion Date: December 31, 1970

Federal Cost: $85,000.00

DESCRIPTION OF PROJECT

This project is to demonstrate the potential for integrating data from automatic remote water quality sensors, manually operated sampling stations, waste load reports, river flow forecasts, and meteorological information with a digital computer in order to provide continuous forecasts of river quality changes for use in water quality planning, management, and enforcement.

The first year activities have been installing monitoring instrumentation and developing the overall data gathering and processing system. The second year will be devoted to further monitoring and data analysis, including application of a continuous dynamic model of the river water quality.

This award is for the second year of a project originally obligated December 30, 1968. The total project cost including this award is $291,200.00 and the total Federal cost is $230,832.00.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5, *Federal Water Pollution Control Act, As Amended.*

PROJECT NUMBER: 16090 DIA (14-12-563)

TITLE OF PROJECT: "Design of Waste Treatment Facilities by Computer"

CONTRACTOR:

Quirk, Lawler, & Matusky Engineers
505 Fifth Avenue
New York, New York 10017

PROJECT DIRECTOR

Thomas P. Quirk, P.E.

Project Site: New York, New York

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 30, 1969

Completion Date: Dec. 31, 1970

Project Cost: $385,000.00

Federal Cost: $385,000.00

DESCRIPTION OF PROJECT

The objective of this project is to develop procedures for computer design of waste treatment plants. The computer consultant firm of Technicomp, Inc., is developing the automated procedures for drawings and specifications under a separate FWQA Contract (16090 ERJ). Quirk, Lawler, and Matusky Engineers is providing the engineering designs and specifications for programming into the computer. The final results of the joint effort would be an automated production of design specifications and drawings suitable for use in bid packages for waste treatment facilities.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 16090 DLU

TITLE OF PROJECT: "Economic Evaluation of Water Quality"

GRANTEE OR CONTRACTOR:	PROJECT DIRECTOR:
Sanitary Engineering Research Lab. University of California Richmond Field Station 1301 46th Street Richmond, California 94894	Prof. Percy H. McGauhey

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost:	$132,842.00	Obligation Date:	August 23, 1963
Total Federal Cost:	$128,249.00	Completion Date:	November 1969

FINAL REPORT:

TITLE: FINAL REPORT ECONOMIC EVALUATION OF WATER QUALITY (16090 DLU 11/69)

Abstract:

The report describes a dtudy that was made into the use of modern mathematical models, programming techniques, and input-output analysis to optimize quality control systems.

Examples that illustrate the use of the models were drawn from San Francisco Bay data and quality requirements.

Copies available from the Clearinghouse, Springfield, Virginia 22151 (189 169) $3.00

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

FWQA(HQ)-9200-3 (4-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6 (b)
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 DQW

TITLE OF PROJECT: "Management of Industrial Waste Discharges in Complex Estuarine Systems"

GRANTEE:	PROJECT DIRECTOR:
Texas A&M Research Foundation P. O. Box FE 44 College Station, Texas 77843	Dr. Roy W. Hann Associate Professor Civil Engineering Dept.

Project Site: Morgan's Point, Texas

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 2, 1968

Project Cost: $509,526.00

Completion Date: May 31, 1972

Federal Cost: $356,428.00

DESCRIPTION OF PROJECT

The objective of the project is to develop and demonstrate a hierarchy of mathematical models which may be applied to the solution of many different management problems regarding industrial waste discharges to estuarine systems. The Houston Ship Channel/Galveston Bay Complex and other Gulf Coast estuaries are much more complicated systems than the East Coast estuaries in which FWQA has considerable modeling experience. The set of models will range from one-dimensional, steady-state to three-dimensional dynamic, all having application, depending on the type and precision of answer desired. A vast portion of the project is gathering the necessary field data for development and calibration of the various models.

A supplemental award of $45,815.00 for additional project costs of $65,793.00 was obligated June 19, 1970, and is included in the above.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 DQZ

TITLE OF PROJECT: "Research Supplement - Journal Water Pollution Control Federation"

GRANTEE: Water Pollution Control Federation 3900 Wisconsin Ave. N.W. Washington, D. C. 20016	PROJECT DIRECTOR: Ralph E. Fuhrman Executive Secretary

Project Site: Washington, D. C.

SPECIFIC DATA ABOUT THIS AWARD

Award Date: January 14, 1969	Project Cost: $83,570.00
Completion Date: August 31, 1969	Federal Cost: $41,824.00

DESCRIPTION OF PROJECT

This project is to publish research papers in the field of water pollution control as a quarterly supplement to the Journal Water Pollution Control Federation. This supplement will present 500 - 600 pages of research work per year.

This award is for the second year of a project originally obligated June 27, 1967. The total project cost including this award is $135,234.00 and the total Federal cost is $109,144.00.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR, WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 DRA

TITLE OF PROJECT: "State Water Quality Management Information System"

GRANTEE:	PROJECT DIRECTOR:
Commonwealth of Pennsylvania Department of Health P. O. Box 90 Harrisburg, Pennsylvania 17102	Walter A. Lyon, Director Bureau of Sanitary Eng.

Project Site: Harrisburg, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	January 30, 1969	Project Cost:	$445,808.00
Completion Date:	June 30, 1970	Federal Cost:	$252,601.00

DESCRIPTION OF PROJECT

The project is developing and demonstrating a computerized data management system to handle all water quality data collected and compiled by the Department of Health. Key items to be automatically filed, analyzed, and frequently updated are all ground and surface water samples, waste effluents, treatment plant performance, and treatment plant construction and modification project status.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 16090 DRM

TITLE OF PROJECT: "A Model for Quantifying Flow Augmentation Benefits"

GRANTEE OR CONTRACTOR:	PROJECT DIRECTOR:
University of Florida Gainesville, Florida 32601	Edwin E. Pyatt Professor of Environmental Engineering

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost:	$119,028.00	Obligation Date:	September 6, 1966
Total Federal Cost:	$111,018.00	Completion Date:	September 1969

FINAL REPORT:

TITLE: A MODEL FOR QUANTIFYING FLOW AUGMENTATION BENEFITS (16090 DRM 9/69)

Abstract:

This project developed a generalized methodology for quantifying the benefits of low flow augmentation for water quality management in a complex river system. These benefits were defined as waste treatment costs avoided. The method used was the integrated utilization of computer based simulation and optimization methods. The models are structured in modular form so that other watersheds can be analysed.

Copies available from the Clearinghouse, Springfield, Virginia 22151 (188 208) $3.00.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, *Federal Water Pollution Control Act, As Amended*

PROJECT NUMBER: 16090 DSS

TITLE OF PROJECT: "Dynamic Planning Techniques for Pollution Abatement"

GRANTEE:

President & Fellows of Harvard College
1350 Massachusetts Ave.
Cambridge, Massachusetts 02138

PROJECT DIRECTOR:

Dr. Harold A. Thomas
Dept. of Environmental Sciences

Project Site: Cambridge, Massachusetts

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 15, 1969

Completion Date: June 29, 1970

Project Cost: $85,632

Federal Cost: $81,350

DESCRIPTION OF PROJECT

The study will develop techniques which will allow quantitative determination of staged construction schedules which will minimize excess treatment facility capacity while still meeting water quality standards. Additional features of the programs to be developed would specify when certain non-treatment alternatives (artificial reaeration, flow augmentation, waste storage) would be economically advantageous in meeting water quality standards.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 DTF

TITLE OF PROJECT: "The Economics of Water Supply and Quality"

GRANTEE:
President & Fellows of
Harvard College
1350 Massachusetts Avenue
Cambridge, Massachusetts 02138

PROJECT DIRECTOR:
Dr. Robert Dorfman
Dept. of Economics

Project Site: Cambridge, Massachusetts

SPECIFIC DATA ABOUT THIS AWARD

Award Date: May 15, 1969

Project Cost: $30,145.00

Completion Date: September 30, 1969

Federal Cost: $27,681.00

DESCRIPTION OF PROJECT

The four year project investigated and modeled the economic and political impacts of various local and regional water quanity and quality management polices. Several simulation models have been developed and demonstrated. The final phase is devoted to model refinement and preparation of the final report.

This is for a nine (9) months terminal award of a project originally obligated December 13, 1965. The total project cost including this award is $129,558.00 and the total Federal cost is $127,094.00.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5, *Federal Water Pollution Control Act,* As Amended.

PROJECT NUMBER: 16090 DUH (14-12-849)

TITLE OF PROJECT: "Stochastic MOdels for Water Quality Management"

CONTRACTOR:	PROJECT DIRECTOR
Stochastics, Inc. Westover Drive Blacksburg, Virginia 24060	Ovadia A. Salama Contract Manager

Project Site: Blacksburg, Virginia

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	February 20, 1970	Project Cost:	$46,496.00
Completion Date:	February 19, 1971	Federal Cost:	$46,496.00

DESCRIPTION OF PROJECT

This study is an extension of work conducted under project WP-01216 of management models. It allows prediction of expected probability distributions of pollutants downstream instead of expected mean values which most current models predict. This type of capability is especially applicable to zones where water quality standards are violated on an intermittant basis. The project is for refinement and further verification of the model.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

WPCHQ-9200-2
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 DVU

TITLE OF PROJECT: "Electronic Analog Simulation of the Salinity Flow System Within the Upper Colorado River Basin"

GRANTEE:	PROJECT DIRECTOR:
Utah State University Utah Water Research Lab. Logan, Utah 84321	Duane G. Chadwick, Associate Professor

Project Site: Logan, Utah

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	March 14, 1969	Project Cost:	$33,117.00
Completion Date:	December 31, 1969	Federal Cost:	$26,997.00

DESCRIPTION OF PROJECT

The study is to demonstrate the applicability of an electronic analog computer for simulating the complex hydrologic and salinity flow systems of the Upper Colorado River Basin. Through the analog simulation of the complex flow system, various alternative management possibilities will be evaluated for a water supply of a given quantity and salinity.

This award is for the second year of a project originally obligated April 17, 1967. The total project cost including this award is $70,093.00 and the total Federal cost is $54,309.00.

WPCHQ-9200-1
(3-70)

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 DWR

TITLE OF PROJECT: "Sequential Use Within a Hydrologic Complex"

GRANTEE:
Utah State University
Utah Water Research Lab.
Logan, Utah 84321

PROJECT DIRECTOR:
David W. Hendricks,
Associate Professor
Utah State University

Project Site: Logan, Utah

SPECIFIC DATA ABOUT THIS AWARD

Award Date: July 1, 1968

Project Cost: $54,126.00

Completion Date: September 30, 1969

Federal Cost: $37,390.00

DESCRIPTION OF PROJECT

This project will demonstrate the desirability of evaluating temporal and spatial variation of water quality within a basin by considering the entire hydrologic cycle rather than river flows only.

The comprehensive basin hydrologic model has beem completed. Performance of the model will be demonstrated on the Little Bear River.

This award is for the third and final year of a project originally obligated December 1, 1965. The total project cost including this award is $167,757.00 and the total Federal cost is $110,470.00.

Address inquiries to the attention of Project Coordination
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, *Federal Water Pollution Control Act, As Amended*

PROJECT NUMBER: 16090 DWX

TITLE OF PROJECT: "The Philosophy of Planning for Water Quality Management"

GRANTEE:	PROJECT DIRECTOR:
Leland Stanford, Jr., University Stanford, California 94305	Professor Ray K. Linsley Dept. of Civil Engineering

Project Site: Stanford, California

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	October 6, 1969	Project Cost:	$42,602.00
Completion Date:	September 30, 1970	Federal Cost:	$40,472.00

DESCRIPTION OF PROJECT

This study will examine the philosophy of planning, as currently practiced, as well as various conceptions of the role which should be played by the planner. Based on this evaluation, planning procedures will be developed so that plans will be more publicly acceptable and workable.

WPCHQ-9200-1
(3-70)

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,

WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 DYX

TITLE OF PROJECT: "Economic Evaluation of Stream Quality Preservation Through Land Use Management"

GRANTEE:
Regional Science Research Institute
G.P.O. Box 8776
Philadelphia, Pennsylvania 19101

PROJECT DIRECTOR:
Dr. R. E. Coughlin

Project Site: Philadelphia, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 9, 1969	Project Cost:	$39,097.00
Completion Date:	May 31, 1970	Federal Cost:	$37,142.00

DESCRIPTION OF PROJECT

The project is devoted to the evaluation of the costs and benefits related to the preservation of a major portion of stream valleys by land use controls to protect or restore high water quality to streams. The first year of the project contributed to the development of the Brandywine Plan for stream valley preservation in the Philadelphia area.

In the second year, mathematical models are being developed for relating urbanization to stream quality. The measurement of stream quality benefit will be determined by relating objective measurements of physical conditions, subjective evaluation and preference rankings by citizens, to land values and water quality.

This award is for the second year of a project originally obligated May 8, 1968. The total project cost including this award is $74,546.00 and the total Federal cost is $71,841.00

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR, WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 EAX

TITLE OF PROJECT: "Basin Management of Water Reuse"

GRANTEE:
Alamo Area Council of Governments
Water Quality Planning
422 3A Life Building
San Antonio, Texas 78205
Louis Koenig-Research

PROJECT DIRECTOR:
Mr. C. Thomas Koch

Project Site: San Antonio, Texas

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	August 13, 1969	Project Cost:	$60,898.00
Completion Date:	October 31, 1970	Federal Cost:	$44,898.00

DESCRIPTION OF PROJECT

The objective of this project is to provide a mathematical model of a water use basin that will include water supply, treatment, water use, reuse, discharge and ultimate disposal components. It will utilize systems analysis to allow selection of an optimum system to fulfill a prespecified demand pattern. This study will be applied to the San Antonio Basin because it offers a practical situation with a large number of possible components to be incorporated in a general theoretical model.

WPCHQ-9200-1
(3-70)

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,

WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 EDC

TITLE OF PROJECT: "Stream Quality Preservation Through Urban Land Use Management: Legal and Government"

GRANTEE:
The Trustees of the University of Pennsylvania
Office of Research Administration
3451 Walnut Street
Philadelphia, Pennsylvania 19104

PROJECT DIRECTOR:
Ann Louis Strong, Director
Institute for Environmental Studies

Project Site: Philadelphia, Pennsylvania

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	July 3, 1969	Project Cost:	$54,126.00
Completion Date:	June 30, 1970	Federal Cost:	$37,390.00

DESCRIPTION OF PROJECT

The project investigated legal and institutional bases for implementing land use management plans for stream quality protection other than the eminent domain procedure. During the first year, the investigators contributed to the development of "The Brandywine Plan." This plan would limit development of stream valleys and steep areas within the Chester County Water Resources Authority through conservation easements purchased from land owners.

When presented for approval to the supervisors of the eight townships covered by the Water Resources Authority, the plan was vetoed 6 to 2. The second year is to document the reasons for this rejection and suggest an alternative implementation method which could be more acceptable to local residents.

This award is for the second year of a project originally obligated July 8, 1968. The total project cost including this award is $67,211.00 and the total Federal cost is $61,601.00.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 EGQ

TITLE OF PROJECT: "Multiple Techniques in Regional Treatment of Water Pollution Systems"

GRANTEE:
The Regents of the Univ. of Calif.
Western Management Sciences Inst.
Graduate School of Business Adm.
University of California
Los Angles, California 90024
Project Site: Los Angles, California

PROJECT DIRECTOR:
Dr. Glenn W. Graves

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 19, 1969

Completion Date: May 31, 1970

Project Cost: $45,364.00

Federal Cost: $39,609.00

DESCRIPTION OF PROJECT

This project is a refinement of the results and techniques developed by project 16090 FPX for optimizing regional waste treatment systems.

The project will be devoted to mathematically refining the programming algorithm (increasing its efficiency) and expanding the alternatives allowable in the planning process. In particular, it is planned to develop the program to calculate the desirable locations, numbers, and sizes of regional plants required (on and engineering economic basis). It is also planned to consider the changes in assimilation capacity of various stream segments caused by large-scale flow transfers about the basin. Finally, the effects of seasonal changes and regional growth on the optimal design will be investigated.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

This sheet describes briefly a

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

Completed under the provisions of the

Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 16090 EOZ

TITLE OF PROJECT: "Operations Research in Water Quality Management"

GRANTEE OR CONTRACTOR:	PROJECT DIRECTOR:
President & Fellows of Harvard College 1350 Massachusetts Ave. Cambridge, Massachusetts 02138	Dr. Harold A. Thomas, Jr.

SPECIFIC DATA ABOUT THE PROJECT

Total Project Cost: $617,064.00	Obligation Date: September 1, 1962
Total Federal Cost: $610,799.00	Completion Date: December 1968

FINAL REPORT:

TITLE: "OPERATIONS RESEARCH IN WATER QUALITY MANAGEMENT"
16090 EOZ 12/68

Abstract:

The study investigated four interrelated programs:

1. Development of stochastic models for the mathematical synthesis of streamflow sequences for analysis or river regulation by computer simulation.

2. Application of the mathematical theory of queues to the design and operation of dam-reservoir systems.

3. Construction of models for computer simulation of multipurpose water resource systems.

4. Development of methods for improved analysis of water treatment designs.

The work has concerned primarily with the Delaware River Basin.

This project was completed under the auspices of the
OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER QUALITY ADMINISTRATION, DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20242

FWQA(HQ)-9200-3 (4-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5, *Federal Water Pollution Control Act,* As Amended.

PROJECT NUMBER: 16090 ERJ (14-12-564)

TITLE OF PROJECT: "Design of Waste Treatment Facilities by Computer"

CONTRACTOR:
Technicomp, Inc.
179 Community Drive
Great Neck, New York 11020

PROJECT DIRECTOR
James J. DeGroat,
President

Project Site: West Hempstead, New York

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 30, 1969

Project Cost: $280,363.00

Completion Date: Dec. 31, 1970

Federal Cost: $280,363.00

DESCRIPTION OF PROJECT

The objective of this project is to develop procedures for computer design of waste treatment plants. The consulting engineering firm of Quirk, Lawler, and Matusky Engineers is providing the engineering designs and specifications for programming into the computer under a separate FWQA contract (16090 DIA). Technicomp is developing this automated procedures for preparation of drawings and specifications as well as providing general computer utilization guidance.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5, Federal Water Pollution Control Act, As Amended.

PROJECT NUMBER: 16090 EXW (14-12-902)

TITLE OF PROJECT: "Factors Affecting Success of Local Pollution Control Referenda"

CONTRACTOR:	PROJECT DIRECTOR
ABT Associates, Inc. 55 Wheeler Street Cambridge, Massachusetts 02138	Robert H. Rea

Project Site: Cambridge, Massachusetts

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 22, 1970	Project Cost:	$48,508.00
Completion Date:	December 22, 1970	Federal Cost:	$48,508.00

DESCRIPTION OF PROJECT

The proposed study would involve a thorough investigation of a large sample of successful and unsuccessful local referenda, connected with the funding of water pollution control projects, employing an intergrated combination of statistical and non-statistical approaches. Study outputs would consist of the following items:

1. A data file on a large sample of relevant referendums submitted to voters in the past several years,
2. A series of narrative reports on selected representative cases studies, based on more intensive investigations of the political and institutional factors surrounding specific referendums,
3. A thorough statistical analysis and evaluation of the "hard" data collected, and
4. An interpretative evaluation of the inferences drawn from procedures (2) and (3) above.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR, WASHINGTON, D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a contract under Section 5, *Federal Water Pollution Control Act, As Amended.*

PROJECT NUMBER: 16090 FEP (12-14-868)

TITLE OF PROJECT: "Improved Water Quality Data Management Using the Hybrid Computer"

CONTRACTOR:
Electronic Associates Inc.
Washington Analysis & Computation Center
12260 Wilkins Avenue
Rockville, Maryland 20852

Project Site:

PROJECT DIRECTOR
Mr. J. Bruce Mawson

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 24, 1970	Project Cost:	$44,872.00
Completion Date:	December 24, 1970	Federal Cost:	$44,872.00

DESCRIPTION OF PROJECT

To demonstrate the improved flexibility, shortened processing time, and reduced cost of water quality simulation using the hybrid (analog/digital) computer instead of straight digital or analog computers.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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WPCHQ-9200-2
(3-70)

INFORMATION SHEET

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 FIO

TITLE OF PROJECT: "Use of General Equilibrium in Water Resources Planning"

GRANTEE:

Georgetown University
Dept. of Economics
Washington, D. C. 20007

PROJECT DIRECTOR:

Mr. J. Eugene Poirier

Project Site: Washington, D. C.

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 11, 1970	Project Cost:	$22,279.00
Completion Date:	May 30, 1971	Federal Cost:	$21,165.00

DESCRIPTION OF PROJECT

The objective of this project is to apply a recently-developed general equilibrium model which would provide a set of equilibrium prices for equating quantities of water produced (made available for use) with the quantities demanded. This information would be of potential decision-making use in policy matters related to: (1) alternative water supply and water quality projects, (2) the effect of pricing policies on physical demand and the use of water, and (3) exploration of alternative levels of water quality, particularly as they relate to optimum levels of treatment.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
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WPCHQ-9200-1
(3-70)

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 FLJ

TITLE OF PROJECT: "Limnological Systems Analysis for the Great Lakes: Phase I -- Preliminary Model Design"

GRANTEE:

Great Lakes Basin
Commission
220 East Huron, Street
Ann Arbor, Michigan 48108

PROJECT DIRECTOR:

Mr. David C. N. Robb
Comprehensive Basin
Planner

Project Site: Ann Arbor, Michigan

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 25, 1970

Completion Date: June 24, 1971

Project Cost: $75,000.00

Federal Cost: $70,000.00

DESCRIPTION OF PROJECT

This project will develop a conceptual mathematical model for physical, chemical, and biological processes, incorporating systems analysis techniques, to simulate the response of large lakes to various water quality management strategies.

A practical model, which can be expeditiously implemented within available financial resources, will be selected, by analyzing the cost trade-offs between models which can answer detailed management questions if supported by extensive data collection programs versus less sophisticated models which provide only generalized management information but require a more modest data collection program.

Following successful development of the model under this grant, it will be implemented and demonstrated on Lake Michigan, followed by application to the other Great Lakes.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

INFORMATION SHEET

CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 6, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 FPP

TITLE OF PROJECT: "Interstate Regional Planning for Water Supply and Waste Disposal"

GRANTEE:	PROJECT DIRECTOR:
Delaware River Bain Comm. P. O. Box 360 Trenton, New Jersey 08603	James F. Wright Executive Director

Project Site: Delaware River Basin above Tocks Island Reservoir

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 29, 1968	Project Cost: $173,725.00
Completion Date: August 31, 1969	Federal Cost: $79,996.00

DESCRIPTION OF PROJECT

The study developed information for planning optimum water supply and waste disposal facilities for an interstate region. This region is influenced by the Tock Island Reservoir and Delaware Water Gap National Recreational Area. Various degrees of regionalization for the area were examined, ranging from 46 small waste treatment plants to a single regional facility.

This award is for the third and final year of a project originally obligated May 6, 1966. The total project cost including this award is $451,781.00 and the total Federal cost is $246,340.00.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

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CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 FPW

TITLE OF PROJECT: "Water Rights Related to Water Quality Storage"

GRANTEE:

Water Resources Research Center
Virginia Polytechnic Inst.
Blacksburg, Virginia 24061

PROJECT DIRECTOR:

William R. Walker, L.L.B

Project Site: Blacksburg, Virginia

SPECIFIC DATA ABOUT THIS AWARD

Award Date: March 31, 1967

Project Cost: $42,240.00

Completion Date: October 31, 1969

Federal Cost: $37,616.00

DESCRIPTION OF PROJECT

The study was concerned with the impact of state water rights on releases of stored water held specifically for water quality purposes. Reviews of statutory and case laws, administrative rulings and legal commentaries, existing and propose legislation and other sources of information will be made in an attempt to define the rights of both riparian owners and appropriation users.

Address inquiries to the attention of Project Coordination

OFFICE OF RESEARCH AND DEVELOPMENT, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION DEPARTMENT OF THE INTERIOR,
WASHINGTON D. C. 20242

WPCHQ-9200-1
(3-70)

INFORMATION SHEET

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5,
Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 FPX

TITLE OF PROJECT: "A Mathematical Model for Regional Treatment of Water Pollution Systems"

GRANTEE:
The Regents of the Univ. of Calif.
Western Management Science Inst.
Graduate School of Business Adm.
University of California
Los Angles, California 90024
Project Site: Los Angles, California

PROJECT DIRECTOR:
Dr. Glenn W. Graves

SPECIFIC DATA ABOUT THIS AWARD

Award Date: June 26, 1967
Project Cost: $74,950.00

Completion Date: May 31, 1969
Federal Cost: $67,228.00

DESCRIPTION OF PROJECT

The project is to develop advanced mathematical techniques for preliminary design of complex regional pollution control systems. Given data on water quality standards, waste sources, treatment costs, transmission costs, and stream assimilation capacity, the optimum mix of all forms of treatment and transport are to be calculated. The detailed objective of the project is to develop programming techniques which can solve large systems of equations efficiently (i.e. Delaware Estuary involves solution of approximately 85 equations with about 2100 variables).

The mathematical techniques developed will be utilized and further refined as project 16090 EGQ.

WPCHQ-9200-1
(3-70)

Address inquiries to the attention of Project Coordination

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WASHINGTON D. C. 20242

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CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 FPZ

TITLE OF PROJECT: "Economic Benefits from an Improvement in Water Quality"

GRANTEE:
Oregon State University
Corvallis, Oregon 97331

PROJECT DIRECTOR:
H. H. Stoevener
Associate Professor
Agricultural Economics

Project Site: Corvallis, Oregon

SPECIFIC DATA ABOUT THIS AWARD

Award Date: July 9, 1968

Project Cost: $34,117.00

Completion Date: July 8, 1970

Federal Cost: $30,639.00

DESCRIPTION OF PROJECT

This is a study of the value of water quality and improvements in water quality in Upper Klamath Lake. An estimate will be made of the benefits resulting from increased recreational use of the lake after technically feasible methods of retarding and/or reversing the eutrophic trends of the lake have been implemented.

A mathematical model has been developed and data collection is nearing completion. The relationship of changes in recreational participation to levels of recreational expenditures in the Klamath County area will now be made.

Address inquiries to the attention of Project Coordination

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DEPARTMENT OF THE INTERIOR,
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CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, *Federal Water Pollution Control Act, As Amended*

PROJECT NUMBER: 16090 FSR

TITLE OF PROJECT: "Michigan Water Resources Information and Enforcement System"

GRANTEE:	**PROJECT DIRECTOR:**
Michigan Water Resources Commission Lansing, Michigan 48926	Gary E. Guenther, Chief Comprehensive Studies Section

Project Site: Lansing, Michigan

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 26, 1970	**Project Cost:**	$129,302.00
Completion Date:	May 31, 1971	**Federal Cost:**	$103,262.00

DESCRIPTION OF PROJECT

This project will demonstrate several innovations for State water quality data processing:

1. Direct interface with FWQA headquarters STORET data bank.
2. Use of a time sharing system.
3. Significant time and cost savings as a result of #1 & #2.
4. Computer-assisted performance grading.
5. Automatic mailing of reminders to organizations for various due dates.
6. Computerization of construction grant priorities as specified in state law.
7. Automatic river-mile coding for station location.
8. Automatic flagging of all water quality violators.

WPCHQ-9200-1
(3-70)

Address inquiries to the attention of Project Coordination

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WASHINGTON D. C. 20242

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CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 FUO

TITLE OF PROJECT: "Data Acquisition Systems in Water Quality Management"

GRANTEE:	PROJECT DIRECTOR:
Colorado State University Fort Collins, Colorado 80521	Mr. Russell Freeman Agricultural Engineering Department

Project Site: Fort Collins, Colorado

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 25, 1970	Project Cost:	$51,574.00
Completion Date:	December 31, 1971	Federal Cost:	$48,909.00

DESCRIPTION OF PROJECT

To analyze the capabilities of three different water quality data acquisition systems--sampling/wet chemistry, electronic sensing probes, aerial surveillance--and to develop a procedure for designing a state water quality monitoring system which is most responsive to program objectives, utilizing the best combination of the three data acquisition techniques.

The design procedure will be demonstrated using data from the State of Colorado.

Address inquiries to the attention of Project Coordination

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WASHINGTON D. C. 20242

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CLEAN WATER

RESEARCH, DEVELOPMENT OR DEMONSTRATION PROJECT

This sheet describes briefly a grant under Section 5, Federal Water Pollution Control Act, As Amended

PROJECT NUMBER: 16090 FZE

TITLE OF PROJECT: "Use of New Analytical Methods in Water Resource Development"

GRANTEE:	PROJECT DIRECTOR:
The University of Texas Austin, Texas 78712	Dr. Charles S. Beightler Dept. of Mechanical Engr.

Project Site: Austin, Texas

SPECIFIC DATA ABOUT THIS AWARD

Award Date:	June 20, 1967	Project Cost:	$17,112.00
Completion Date:	August 31, 1969	Federal Cost:	$15,508.00

DESCRIPTION OF PROJECT

The project was devoted to basic research in systems analysis mathematics - specifically improvement of dynamic programming techniques for optimization of branched allocation systems. The techniques are to be applied to finding the best locations for reservoirs in river basins.

A final report is expected in the near future.

Address inquiries to the attention of Project Coordination

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